

ENVIRONMENTAL POLICY IN INDIA

*(Papers and Proceedings of the Orientation Seminar
on India's Policy on Environment
April 12-13, 1982)*

Edited by
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FOREWORD

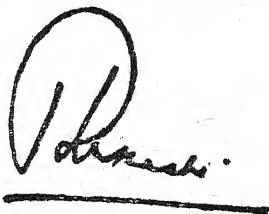
I feel happy that the Indian Institute of Public Administration has made a beginning, by compiling these papers, at contributing to the very important debate on India's environmental policies.

Today, when the proper management of our natural resources has become an important priority, the awareness of what we are doing to our environment and how and with what urgency we need to conserve it, unfortunately still seems lacking.

It is, therefore, time that people from all walks of life, be they administrators, politicians, academics, journalists or activists, are oriented towards looking closely at the threats to our natural environment and the policies and legislations that are in existence to meet these threats.

The Indian Institute of Public Administration has accepted the challenge of helping to bring about environmental awareness where it is most crucially needed: among the policy formulators, and this seminar and the resultant publication go quite some way in this effort.

We hope that in the years to come we will be able to increasingly contribute to this very important area of public administration and that our efforts, and the efforts of many others like us, would be rewarded by their coming into existence a social order which cooperates with nature, rather than seeking to exploit it.



(P.R. DUBHASHI)

Director

INDIAN INSTITUTE OF
PUBLIC ADMINISTRATION

NEW DELHI
APRIL 21, 1984



PREFACE

This volume is a collection of papers presented at the Orientation Seminar on India's Policy on Environment, sponsored by the Department of Environment, Government of India. The purpose of this seminar was to make people in the government, in the universities and in voluntary agencies, aware of the importance of environmental management and conservation, and to discuss the existing government policies on environment.

The papers included in this volume, along with the abstracts of discussion, deal mainly with the following areas:

- (a) Environmental problems in India.
- (b) The history of environmental policy formulation in India.
- (c) The existing environmental policies and legislations in India.
- (d) A critical analysis of some of these policies and legislations.

Whatever might be the current value of such a collection, we also hope that this volume, insofar as it lays down the situation as it exists now, would be an asset to those who, in times to come, would like to understand the various stages through which environmental awareness and policy formulation passed in the process of reaching that satisfactory level that we all fervently hope for in the not too distant future.

In preparing this volume, and generally in making this seminar possible, many people and organisations have contributed. Though it is not possible to name each one of them, I would specially like to thank, on behalf of the IIPA, the Department of Environment for giving us the grant that made this seminar possible.

Thanks are also due to various organisations, chief among them being the Bombay Natural History Society and the World Wildlife Fund-India: specifically Dr. A.N.D. Nanavati,

Dr. J.C. Daniel, Dr. R. Grubb, Ms. Azra S. Bhatia, Shri Isaac D. Kehimkar, Lt.-Col. J.C. Sawhney, Miss Meena Wadhwani and Mrs. D. Variava.

We are extremely grateful to the numerous individuals and organisations all over the country who responded at short notice to our appeal for reports and data.

We owe a very special debt to Dr. R.B. Jain who, as a guest faculty, was involved in the planning and implementation of the seminar right from the start.

NEW DELHI,
APRIL 12, 1984

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SESSION I

INAUGURAL ADDRESS

P.R. DUBHASHI

The Chairman of the National Committee on Environmental Planning, Shri B.B. Vohra, and participants in this orientation seminar on India's Policy on Environment,

Let me, at the outset, add my very warm welcome, as the Director of the Indian Institute of Public Administration, to you all to the welcome already extended to you by my colleague at the Institute, Shri Shekhar Singh.

This seminar marks the first effort of the Indian Institute of Public Administration in the field of our programmes related to environment. This, of course, does not mean that we at the Institute were totally oblivious of any concept of environment at all and its relevance and relation to public administration, which is the chief concern of the Indian Institute of Public Administration. But, I think we must confess that our concern with environment was somewhat peripheral and fitful, and it amounted to nothing more than a lecture or two in various courses of training conducted at the Indian Institute of Public Administration. But now, with this seminar, we are hopefully beginning a phase of greater concern with issues related to the environment. In the months and years to come, not only would environment find its proper place in the Advanced Professional Programme of Public Administration and other programmes conducted at the Institute, but there would be specific seminars and training programmes, and maybe studies and research in the whole field of environment as it is related to diverse aspects and sectors of public administration.

As we start reflecting seriously on the whole subject of environment, in relation to public administration, the minds of all of us go back to the year 1972 when the world manifested its concern for environment by organising an international

conference on environment at Stockholm. This seminar of ours is in the historic year which marks a decade of the Stockholm Conference.

At the Stockholm Conference, the leaders and administrators and policy makers of the developed countries gathered together to discuss environment and its pollution and its impact on the quality of life, because they felt that it was the major problem confronting the affluent western civilization. Not that this concern was not felt in the past; at least for two or three hundred years since the factory system of the industrial civilization came into being, the western world had taken note of the impact of industrialization on the quality of life. But here again, this was considered to be peripheral and not central to the management of the economy and the society. I think, it was Prof. Pigou who, for the first time, wrote about 'welfare economics'. You know this science of economics, which has been dismissed as a dismal science by Ruskin, had dealt with maximization of profit and material benefit and had little concern for welfare. It was in Prof. Pigou's book called *Economics of Welfare*, which was a landmark indeed in the history of economic thought, that a distinction was made between private benefit and private cost as against social benefit and social cost.

All economic decisions in this world of capitalism were made on the basis of the calculus of private costs and private benefit, and profit decided all the decisions of the economic decision makers in the economic system. But what about the costs of these decisions in social terms? What about the smoke and the noise which the factories create? Is there no price tag attached to them? It was Prof. Pigou who said that in the social decision-making process related to economic matters, we must take note of social benefit no less than private profit, social costs no less than private costs. That was the beginning of the thinking that has been developed by economists, of which perhaps the later outstanding example was *The Affluent Society* by John Kenneth Galbraith, who talked of the quality of life and who made a distinction between private opulence and public travail.

These were the kind of thoughts which were uppermost in the minds of the international leaders who organised this

Stockholm Conference, which focused the world's attention on 'environment'. India also joined there. I remember Dr. Karan Singh was the leader of the Indian delegation, and we took a view, as indeed the developing countries of the world took the view, which was somewhat different from this kind of overriding concern of the western countries with environmental pollution. We took the view that it is not so much the pollution *per se* that is a problem, the worst pollution is poverty. And the pre-occupation of the developing countries is with poverty rather than with environmental pollution. We thought like the hungry people who consider that certain diseases are the diseases of the rich people, about which the poor people need not bother. 'Indigestion'? Now, how can a hungry person take any note of the problem of 'indigestion'. It is a problem for those fat people who feed themselves at the banquet with all kinds of spicy rich food and then talk of indigestion. So, at the banquet of the world, the rich countries having filled themselves up with prosperity over two or three centuries, and having gone about in an indiscriminate, extravagant and even scandalous manner, exploiting the resources of nature and creating for themselves this kind of materialistic civilization, having saturated themselves with material prosperity, these people are coming round and telling us, when we are just entering to share the crumbs, left at the banquet table, when we are just coming to start our material advancement, these people come and say: "No, no, no, no, you do not eat too much food because the resources of food are drying up." So, we took that view, and we thought that environmental pollution is a disease of the rich, about which the poor need not bother much.

But since this historic conference of Stockholm, the world outlook, as indeed the outlook of developing countries, and of India, has undergone a change because the experience of the last decade has proved to be an eye-opener. In 1972 what was bad? 'The Air'! The air was not pure and policemen in Tokyo were using a mask in order that they do not get polluted by the foul air that they had to inhale. So the policemen in Tokyo were doing their work with a mask on their noses. All right, that is bad enough. And what else was happening? The lakes of the United States of

America were vanishing, were denuded of fish because the fish could not survive the industrial waste that was let out in the lakes. Now that is also bad. If the fish die, then you should certainly shed tears, for you may not be able to eat fish. But perhaps you exploit fish from somewhere else—from the Indian Ocean or the Arabian Sea or wherever else it may be. So, it is bad enough if the fish die, it is bad enough if you do not inhale, but it is not really that bad, as long as you can move around in large cars—one for each member of the family—not for one family but for each member of the family—so long as you can go around at a moment's notice in large cars burning huge quantity of petroleum and overheating your rooms, so that in the worst of the cold you perspire in the room. So long as we are assured of this standard of living, we do not have to bother really about environment.

But somewhere in 1973, when the Oil hike came, then in one sudden move, as it were, the western world discovered that the very basis of their extravagance was crumbling, and then they started realising that they were killing the goose that laid the golden eggs—that you cannot assume, as you have assumed all along in the history of the material civilization of the human race, you cannot assume that nature's resources are infinite and that you can simply go on drawing on the natural treasure at will and start, as it were, fulfilling your greed for material prosperity. What else is it? A lust! I think that is a better word. And they realised that natural resources are not infinite, that they are finite; and they realised that before we know where we are, before the end of the century, many of the finite resources are going to dry up. This threatened, to the very foundation, the edifice of material civilization of the west of which they were so proud. This is what created a scare and gave a new dimension altogether to this whole problem of environment and management. It is not only that water and air are getting polluted, it is not only that the fish and other species are dying, it is also that the very survival of the human race and its civilization is at stake.

If this is the realization even of the materially advanced countries of the west, what about us? We should also realize that though we are poor and though we are almost at the bottom of the ladder of standards of living of the people of

the world, yet if it comes to materialism, we are also not found to be wanting. Look what we have done! Our greatest treasure was the Himalayan forest. And what happened to that? President Reddy goes to Kulu and finds, as I found also when I visited it later, that this beautiful place where Jawaharlal Nehru found solace in the midst of hectic life, was also getting barren. Let alone the beautiful hills in the Western Maharashtra, which are now completely bereft of what they rightly called the 'forest canopy'. The forest canopy does not exist.

I was shocked to hear the other day that there is going to be an advance of desert, not in Rajasthan to which we are used and about which we do not care, but in the North Eastern region. According to the geography to which I am accustomed, Cherrapunji has the highest rainfall anywhere in the world—but now those areas are also getting affected in this manner.

As Dr. Swaminathan said the other day, in Himachal Pradesh, in the lap of the Himalayas, the forests are denuding because of apple growing. Apples need to be packed, if they are to be made available to people in Kerala, if not in Delhi. And packing requires wood, and wood requires forest. And if the forest is cut then apples may prosper but the forest may decline. And this is what has happened in Himachal Pradesh.

In Himachal there is an apple revolution—ten million tonnes of apple will be grown in Himachal Pradesh alone. But one hectare of apple requires ten hectares of forest for the packing. I went to a place where these apples are grown in the valley—a place called Noorpurgarh—and found that the whole of Kotgarh area was getting prosperous in terms of the apple orchards, but the forests certainly were getting scarcer and scarcer. The main problem of the apple-growers was to get wood for packing—not to grow apples, that was not the limitation. The limitation was to get wood for packing. This is the kind of imbalance that takes place.

Not only are the forests getting denuded in the Western Ghats and in the Himalayas, but also in the North-East Areas of the country.

What is happening to soil? You find that as a result of

the pressure of population, cultivation is getting extended to the higher reaches, and on the slope of hills this cultivation has so loosened the soil that the hill slopes are getting denuded, and as a result valleys are farmed, down below, and the soil down below is also getting affected. The district of North Cannara, to which I belong, and where I worked some time ago as Regional Commissioner, once had a pride of forests. But then we said that people there cannot live on forest alone, and forest was cut and agriculture and rice cultivation developed. Very good. But that was not enough. You say that there are rivers. So let us bund them and have hydro-electric projects, and as a result of the hydro-electric projects you destroy the flora and the fauna and the forest, and you no doubt supply electricity to the distant Bangalore, but your forest is lost once and for all.

You start a paper factory. The Marwari families go there and start investing in paper mills. Very good. And they cut the bamboo and they cut the other forest and thus develop more paper. But they are not responsible for replanting. And, therefore, the whole rich forest there is getting sacrificed at the altar of this kind of prosperity.

So you are destroying the soil, you are destroying the forest, you are also destroying your water resources. Everywhere we are developing minor irrigation, and more wells are dug, but you cannot take from the water, to use the words of Swaminathan—'from the sanctuary of underground water—you cannot draw more water than what the mother earth stores after years and years of efforts'. If you do that, the water will vanish and your wealth will turn into an empty hole.

And what about surface irrigation? There also we are very extravagant. The Japanese or the Israelies use water with a great sense of economy. We are like the prodigal son. We think that we have *sujala-suphala*—rivers flow in our land and we can use any water, in any quantity, in any manner, with the result that in most of our irrigation projects water is used with such extravagance that large areas under these irrigation projects suffer from water-logging. Once we blamed our fate that we have to rely on uncertain rains, and there was no water, and against that we now have destroyed per-

manently our precious soil which used to at least grow something in the past and now grows nothing at all as it has become water-logged.

Along with this is the extravagant exploitation of forests by selfish contractors. I read only yesterday that these contractors have gone about like criminals denuding the forests of Madhya Pradesh. Madhya Pradesh was the pride of our forest wealth, where we thought that the forest wealth would never disappear. And here these people, within ten years, have through their vendetta on nature, destroyed the beautiful forest canopy of Madhya Pradesh.

So it is not that the elephant is the destroyer or the lion is the destroyer. Really we started digging our own grave in this country, where materialism and consumerism has gone about with such vengeance that while we have not become rich, in the sense that the average standard of living has not gone up materially, we certainly have destroyed our precious natural resources.

A thought comes to me that I must shed my tears at this behaviour in this country which has such a cultural heritage. We always worshipped nature. Which are our gods? Our rivers are our gods. And there is the Bhoo Devi, and Vana Devi, soil is god and forest is god, and Surya is Bhagwan—Surya Bhagwan is the greatest of our gods. So we are worshippers of nature. We do not believe that for human progress we have to exploit nature.

Now we say that you must exploit nature for economic development. But this is not so—we are not the descendants of a civilization which has been built on the exploitation of nature. Our civilization says that nature is divinity. We have given the attributes of divinity to nature. We want to live with nature and we want to grow with nature. This is also a country of Mahatma Gandhi who has definitely said that the quality of life does not depend on the multiplication of human wants but rather on their limitations. All our religions have said so. It does not mean that you must go hungry. But it certainly means that greed and the fulfilment of greed is not the purpose of life.

It is a matter of regret that these things need to be stated in this country of Buddha and Gandhi, and a country

of the saints of the Vedic civilization and the Upanishads, who have always preached of a life in harmony with nature. If there is anything which distinguishes 'Bharat', this country, from the other countries of the world, it is our heritage of living in harmony with nature.

Now a days nature is called the life supporting system and nature is a life supporting and life sustaining system. So a development prospect which is built on the destruction of life supporting and life sustaining systems is bound to be counterproductive, and this is what is happening. This realization has made us think that we can no longer ignore environment, we can no longer say that environmental problems are the disease of the rich.

It has been realised that nature's resources are finite, and that we have gone about exploiting this nature in a manner which is indeed criminal and which is indeed going to be counterproductive. And, therefore, we have now started thinking more seriously. The presence of Shri Vohra as the Chairman of this Committee on Environment, and the creation of a separate Department of Environment, and the insistence that every industrial project must be cleared from the environmental point of view—these are all indications of a change in the right direction.

But, this cannot be a kind of a haphazard concern. It has to be a systematic concern, it has to be a wide-ranging concern. It is not enough that we create a structure of legislation or have a bundle of ideas. We must create also a structure of administration, we must see that administration in all the relevant departments which are concerned with land and soil and water and forest and flora and fauna—they are all as it were, affected or influenced very deeply by this concern for preservation of environment. I mentioned our saintly tradition, and I often like to quote Saint Tuka Ram of Maharashtra, for I remember one of his sayings, where he says, that flora and fauna are my kith and kin. When will the Forest Department officers, who have often made common cause with these exploiters of forests—when will they start saying that flora and fauna are my kith and kin? When will they say it?

A few days ago I read that on the coast of Kathiawar,

Saurashtra, a cement factory is established and the mud that is drained into the sea there has completely destroyed the fish in that area. As a result, you are not going to get prawns and the like, because the nurseries of prawns are damaged there. Similarly, if you go to Karwar, somebody started a soda ash factory there, and the prawns and other species have been destroyed.

Now, if you go about destroying in this manner—and this is not necessary, for a little care on your part will enable you to have development as well as preservation of nature—now if you allow these marauders—I think that is the word to use—to go about exploiting the heritage of this country, millions of ordinary people and the future generation of this country—Bharat—are going to suffer, while these people will make tons and tons of money, I do not know to what effect.

Therefore, a time has come for us not only to see that every project in every sector, whether it is public or private, is rigorously examined from the point of view of environment, but that our total thinking about planning and development looks upon the economy and ecology as part and parcel of the same process of development of human civilization, and that every department of administration, every project, is looked from this point of view and that not only do we preserve our natural heritage, we enrich it by conscious means.

Indian forests, I think, have come down from 22 per cent to 10 per cent, and they will go down further. The minimum that is required for sustaining human civilization is that at least 33 per cent of the land mass should be under forests. And we are going down from 22 to 10 per cent.

Our people must be woken up once again to the eternal heritage of human civilization which are enshrined in the epics of India. I sometimes feel that we have to learn much more from the roots of our civilization than from the borrowed wisdom of the west.

And so, I have gone on and on talking at length on this subject not so much because I was here to inaugurate the conference, not so much because I am a highly knowledgeable person—I think Vohra is the knowledgeable person—it is because of my overwhelmingly emotional concern with this issue of environment.

I have very great pleasure in declaring inaugurated this seminar. I have very great pleasure in welcoming you all, and my inaugural talk would have fulfilled its purpose if it has carried to you also the same amount of emotional concern—I do not believe that administrators are supposed to be non-emotional. We administrators are compared with cogs in the wheel. Administration is called a 'machinery'. There cannot be a more profound mistake than this. 'Administration' is not 'machinery'. It consists of human beings, and it is a set of human beings working for the large mass of human beings. Therefore, nothing is more important in administration than human concern. On an issue such as this 'environment and administration', I think we have to bring to bear our deep emotions and deep historic and ancient memories of our civilization to deal with this problem which is concerned not only with the present but also with the future.

Thank you very much. I will now request, on behalf of all of you, our Chief Guest, Shri B.B. Vohra, to give his Address and to tell us how he would like us as individuals—I find in this gathering there are representatives of administrative departments, of voluntary agencies, of academic institutions, social workers and so on—to put our heads together and work for this very very great concern of the relation between environment and development. □

KEYNOTE ADDRESS

B.B. VOHRA

Mr. Dubhashi, Prof. Shekhar Singh, ladies and gentlemen.

It has been a very moving experience for me to have heard the inspiring address by Mr. Dubhashi. I feel that every word that he said came from the bottom of his heart and it's a very gratifying thing to know that people like him, at the head of an institution like the IIPA are enlightened and knowledgeable enough to feel strongly and deeply about the environment. I am sure that the spirit will affect all of you here and in turn will spread to others with whom you come into contact in the days to come.

As Mr. Dubhashi said, environment is not a subject which can be dealt with in isolation by a few people. It must become a concern of everybody because what is involved is the very quality of life and it is the amount of importance which we give to this matter that will determine what is done in this field. It has been only because very little attention has been paid to these matters, to which he's drawn your attention, that so far, little has been achieved in the field of environment. Actually, we are at the stage where we are just beginning to debate what our policy for environment should be and it is a very welcome sign that more and more people are beginning to take an interest in the subject.

As Mr. Dubhashi very correctly pointed out, interest in the subject began more or less in 1972 when the major topic for discussion used to be pollution and after that the danger to various species of flora and fauna. These were concerns which were felt in the west and we naturally inherited them. But there are certain problems which are just not known to the west and which are nevertheless of very great importance to us and I will, in a moment, trace the history of how our consciousness of these problems grew and where we stand with

respect to them at the moment.

I remember I was asked to be a member of the committee which had to prepare documents for the Stockholm Conference which was attended by the Prime Minister herself. There were meetings held for many months and we tried to identify the various topics which should be of concern to us in the field of environment. As early as 1972, we felt that it was not only pollution and the danger to species but also the very great mismanagement of the country's land and water resources which must receive our attention, and this matter was included in the brief of the Indian delegation. Within our own country, it was highlighted enough to receive attention from the Prime Minister and in a very famous minute she said, as far back as 1973, that we must start caring for our land resources in a more serious manner.

I mention all this because, even till today, that intention has yet to be translated into reality. As an administrator it is my preoccupation to get good intentions translated into action which will change the situation on the ground, so to say.

This subject of environment will perhaps receive a lot of attention at this seminar. I am, however, reminded of another seminar which I attended some time ago. Seminars are dominated by academics and it is right that they should be so, but at this particular seminar there was a long discussion, to start with, as to what was meant by the word 'environment'. Somebody came up and quoted some professors as saying that 'environment' is everything which is outside yourself and so on and so forth. I had to listen for quite a long time to this interminable discussion about that we were going to discuss. In the end, however, it set me thinking that it is not such a silly discussion after all because, if you analyse carefully, many people today have very different ideas about what's important in the field of environment. There are people who are very conscious of the pollution of the air, and of the water and land, and others who are very conscious of threat to the Great Indian Bustard and to the Tiger or the Rhino. There are still others who worry about forests and the way the forests are being destroyed. It, therefore, occurred to me that it would perhaps be a good thing at this stage, which is still a

preliminary stage as our department is just a little over a year old and we have still to mount any properly identifiable programmes in the field of environment, to sort out our ideas and to try and define exactly what we should mean by the word 'environment'.

THE TIWARI COMMITTEE

A few months ago we decided to discuss this matter in the National Committee and we decided not to re-invent the wheel, so to say, but to go back to the first document which had paid serious attention to this matter. I am referring to the Tiwari Committee which was set up in February, 1980, as soon as Mrs. Gandhi came back to the government. She set up a committee under the chairmanship of the Deputy Chairman of the Planning Commission, to suggest the administrative and legislative measures that ought to be taken for the protection of the environment. This, incidentally, was part of the Congress party's election manifesto, that they would do something for the environment. It was also a part of the manifestos of almost all other political parties. For once, political parties were agreed that the environment had to receive attention.

The government's announcement of this committee was welcomed by every quarter and this committee produced a report after six or seven months of labour in which one of the services it performed was that it identified the major areas of concern in the environment, and I think before we discuss a policy on environment we might consider what the areas of concern were which the Tiwari Committee identified.

LAND AND WATER MANAGEMENT

I am very happy to say that the very first area which they identified was an area of concern which was not imported by us from the west. It is a subject which never figured in the literature of the west on environment, and still does not, for that matter. We tried to make an effort within the UNEP to make the developed countries realise how important this matter is to us. This is the question, as the Prime Minister said, not only of the environment. There is an elitist element

who discuss environment in certain quarters. It is the done thing and very fashionable to talk about environment and many people jump on to this band wagon without really being very concerned about it. But the subject which is almost never mentioned in any western literature on environment and which has never really concerned them because it is not within their experience is, as the Prime Minister said, a matter of survival for us and not merely of theoretical interest. That is the matter to which Mr. Dubhashi has drawn our attention, the destruction of forests, therefore destruction of soil and therefore the loss of a great deal of water which could otherwise have been retained as ground water and been available for us throughout the year, because ground water gets recharged from the rains through seepage and seepage takes place best where the run off is slow. The run off is slow only where there is vegetation on the ground and the ground is not bare. But, in addition to all this, the loss of top soil which takes nature a thousand years to make one inch of, and the loss of a lot of water, and the loss of forests, and along with a loss of the soil the loss of productivity, which means the spread of the desert and all that.

DAMS

There is also the other question of how much damage this kind of situation causes to us on account of siltation of our dams, of our reservoirs and of the siltation of our rivers. We have spent over Rs. 10,000 crores on our dams and on our reservoirs, as these are supplying us not only water but also hydroelectricity, and they are also flood control measures. If the big reservoirs become, as somebody put it, very large flat polo grounds on account of the siltation, we would have suffered economically in a way which is almost beyond description, because even if we had the money, we would not have any other locations for building other dams. I am just trying to say how very important this single matter is which the Tiwari Committee put at the head of its list.

The siltation of rivers by the silt which is carried down from the denuded slopes of forests causes floods. We can't compute the price we pay for floods, but estimates say that

it is about a thousand crores or so a year. This kind of situation is really not an ordinary situation for us, its really a matter of life and death and, therefore, I think the Tiwari Committee very correctly put it as the very first of the four areas which it identified as areas of major concern.

It's easy to identify an area like this, and to say that proper management of land and water, or the proper management of the soil, should be there. You can have a dozen different phrases to mention all this: management of water sheds, command areas, river basins. You can employ any number of words. But I think we have to go deeper into this and discuss as to what actually needs to be done and how, perhaps we can do the kind of job needed to be done. I do not know whether this seminar would be the proper forum for such a discussion or perhaps subsequent seminars limited in scope and focused only on each single item should be held. But, anyway, I will give you a very broad view of what is my opinion and the opinion of several others, who are better qualified to opine on these matters, as to what needs to be done.

You know the major areas of concern within the broad heading of land and water management, and we can leave out water because if we manage the land, water is managed automatically. Also, because water is an annual resource and comes down to us every year either as snow or as rain and if you don't manage it well this year you can manage it well next year provided of course that the soil is there and the forests are there. But, once the forests and soil are lost, then you cannot manage the water in any case. So we might as well not talk of water management for the time being, the two are so interconnected that one means the other, so we don't lose anything by keeping out water for the moment. But lets just talk therefore of land management for a while.

SOIL EROSION

Now, what exactly does it mean? It means mainly two major problems which Mr. Dubhashi has already mentioned—one is the threat to the land, the most serious being the erosion of top soil. This erosion can be either by water, in

areas where there is heavy rainfall and there are slopes, and there is not enough vegetative cover. This is erosion by water and this leads to the effects I have already mentioned. There is also erosion by wind which is taking place in the Rajasthan desert, for instance, and is supposed to be increasing the size of the desert by some known figure every year, there is some dispute about the figure so I won't mention it. The answer in both cases lies in leaving the land alone because we must understand that erosion of the top soil, whether in conditions of heavy rainfall or in conditions of strong winds in arid circumstances, is caused mainly, if not altogether, by the activities of man and beast.

At one time these areas were good forests and it is historically known that only when man penetrated into the forest and cut them down for their own use and left the land bare that water and wind began to have such a disastrous effect on the soil. Well, the answer really lies, therefore, in trying to keep a way: not only should man himself keep away but also his animals, because in all these areas grazing does a great deal to prevent the natural regeneration of vegetation. Experiments have been carried out both in Rajasthan's deserts and in the Himalayas and we have found that all you've got to do is fence off an area completely by barbed wire and within one or two seasons, thanks to our high temperatures and long hours of sunlight, within a couple of seasons there is a good cover on the land by way of grasses and shrubs.

How can we attempt this? This question will have to be answered one of these days before we can do anything serious or concrete about this problem. It's not as if the problem is without an answer because side by side with the difficulties in fencing off areas, we have the promising situation created by the discovery of new plants, new trees like the subabul, and the eucalyptus, and there are many others on the way which grow at a fantastically fast rate. We, therefore, have to, sooner or later, go deeply into these matters and, area by area, depending on the locality, get willing cooperation of the people and persuade them to set aside a common land of say a 100 acres, to set aside one-fifth or one-fourth in the first year and let the grass and the trees grow.

This is, in fact, happening in parts of Gujarat and Rajas-

than, in a very small scale though, through social forestry projects. We then let the grass be harvested by hand, instead of letting the animals into it, who eat up more than necessary and trample on the young shoots, and compact the soil and so on and so forth. So, these are things which can be done, and a lot of work would have to be done to gain the confidence of the local people and convince them that if they follow these procedures they will stand to gain a great deal in the long run. First couple of years they may be put to some hardship for which some provision will have to be made by the government or by voluntary agencies or whoever is trying to do this work. They would have to give them advances to tide them over for that period.

This applies to both water and wind eroded areas. In wind eroded areas we have to create wind belts, and prevent the winds from blowing up sand and lodging it on young crops. But this is the kind of approach I can just hint at in the limited time we have. These things will have to be followed up and it is important to remember that although it is a very very difficult operation and I think nobody has yet tried it on a big enough scale anywhere, something can be done if the will is there and this land which is yielding nothing today can be made to yield upto four or five thousand rupees an acre and even if the figure is halved, I think it is a very good figure compared to the current figures of crop production. This is the kind of potential that the land has.

WATER LOGGING

Threat to the land as represented, and as Mr. Dubhashi has pointed out, by water logging, is a phenomenon peculiar only to surface irrigated areas: areas irrigated by surface project like canals. Ground water is a different category altogether because there the man has to pay for the pumping of the water. Although the water is free and he doesn't have to, at the moment under our laws, pay anybody for the water which lies under the ground, however he has to pay the cost of electricity, which is of course subsidised in many cases, or the cost of diesel which is also subsidised, but in any case the man has to pay in relation to the amount of water he draws.

For the longer he works the tube well, the more he has to pay. So, he is careful and he is his own boss and uses just that much as is necessary to the crop. There is no question of land becoming water logged. He can also shape the land, terrace it exactly as he wants, as he need not consult anybody else.

However, in surface irrigation projects we still have odd situations where the outlet from which water comes may serve as much as 500 acres and no small channels are created by the irrigation departments, though they are trying to do this now ever since we started creating a howl about this 10 years ago. No detailed work is done to take the water to every single farmer and this is a very very difficult matter, I must confess, because farmers fields are not consolidated. Sometimes in the command of a canal system the farmer has land at 10 different places, so the first thing is consolidation and the next thing is to level the land according to geography, local topography and to see that while each piece of land will get the water it needs, we must also ensure that each farmer must also be able to cut off supply when he doesn't need the water. Any excess water which has come into the field has to be drained away.

At the moment, the water logging that Mr. Dubhashi referred to was due to the fact that in a very large part of the 20 odd million hectares of land which are serviced by canals, there's no direct irrigation for each field. What happens is that from the outlet, water is let out to the nearest field which happens to be higher than the fields that are further away because the canal runs along the highest contour of the natural region. The water thereafter is supposed to go from field to field, once one is flooded it is let out to the lower fields and so on till it reaches the farthest field. This is a very unsatisfactory state of affairs and I mention all this because this is part of the problems of environment and we must tackle these pedestrian and uninteresting problems: everything is not a Rhino or a Tiger in the jungle with romantic surroundings. These are facts of life which also have to be tackled and I can tell you, it is a very very difficult problem. Although we set up command areas about 10 years ago, what has been done about it. What we have to do is to see that

each unit of sequence is the command of each outlet. We have got to see that all areas which can be provided irrigation from that outlet must be shaped by bull dozers.

I will tell you a little story which will illustrate how difficult these matters are. It was in 1966, just before the Punjab partition, that I was Secretary Agriculture and I thought I did a very very big thing by persuading the government to bring water to the biggest farm in Asia which is the Hissar farm: 40,000 acres. It is so big that nobody has ever seen every part of it. People used to go to the reserves kept for the benefit of various kinds of people who like to shoot black buck, etc., and it has a large number of cows. Even the purpose of this farm is not well defined. It is such a large piece of real estate that it occurred to me that we were not using even 10 per cent of its potential. So when we looked into the matter, we spent a couple of crores and were able to bring some water and put it into the farm. On the basis of the water we drew up a very very ambitious plan for utilisation of the land, including an entire university, the Hissar Agricultural University. I lost touch with this farm and came to Delhi and a year ago, fourteen years after I had left Punjab, the Vice-Chancellor of Hissar Agricultural University and I took a couple of days off to see new breeding centres for cattle at this farm. While there, I asked what was the condition of the soil and the soil scientist said that water is rising at the rate of a foot a year and it is now 5 or 6 feet away. I felt crushed. I felt that if the water comes up any further all this would be destroyed. Even the buildings were showing signs of saltpetre. This just goes to show that it is foolish to bring water to a place unless you know how it is going to affect soil. This is a matter which cannot be hardly easily discussed in drawing rooms as part of the environment, as you can discuss the Great Indian Bustard, but it is a matter of life and death for us. We really don't know what will happen to the country if the population, rising at the rate of 2.4 per cent a year, will stabilise at a level higher than that of the Chinese population. Recently, some Chinese said that you will stabilise at 1600 millions in 2250. This kind of a pressure on the land and the existing level of poverty is again not funny. If any body has been to Western UP or Bihar or Orissa and

seen the 300-350 million people who live below the level of absolute poverty: which is nice to talk about academically but very difficult to experience because it means Rs. 2 a day. What can you get for Rs. 2 a day.

In an industrial situation sometimes a factory becomes uneconomical and you can wrap it up or close it down or at some later stage you can change it, like the Maruti factory, or do something else with it. That asset remains as it is, it is not lost if you are careful and don't let the parts get rusted. This is not so in the case of agricultural resources.

When you don't utilise the land resource properly, it is not a static situation. It is not as if a factory, instead of producing 1,000 cars, is producing 500 cars a day. That is quite different, because the unutilised potential remains undamaged and can be utilized under better conditions with more electricity, more raw material, better labour relations, etc. Your resource base is not damaged. But with land, if the resource base is not utilised properly it gets damaged. A time reaches when it is dead. So it is not a question of our just remaining quiet on this matter, because if we remain quiet the land resources will be totally eroded, and so we have no option but to get up and do something. My only hope is that we are not too late already. In fact, quite frankly, I feel that even if the powers that be decreed that we will do the right things as of now, the mobilising of people and training them: we will require sociologists, engineers, foresters, drainage people, if we want to make a proper job of this matter, is still going to take us ten years. And ten years of unchecked soil erosion and waterlogging of our newly irrigated areas may take us beyond the point of no return.

There is so little interest people have in these matters that we still don't have accurate figures of what is happening to our land resources. We have great differences of opinion and we don't have basic figures.

URBANISATION

These are the two major threats. There are, however, other threats which are worth mentioning. As you know, we are just beginning to get urbanised. We are still 80 per cent rural.

but our towns and cities are growing rapidly and there is no method yet of channelling our growth of towns into land which is not agriculturally rich. Some of our best farm land is going into urban use and for all times these lands are lost.

I was the officer who had the good or bad fortune of acquiring land for this new town of Chandigarh. We started from scratch and I tell you we started with the best of intentions. We had the benefit of the best possible advice and we had world famous town planners to advise us. There was a site selection committee and they chose a wonderful site, with a beautiful backdrop of hills and one or two seasonal streams which marked the boundary of the town and which could be converted into a lake. We were very satisfied and acquired a lot of land, but 17 villages were pushed out. We gave them money and other land and I never had any feeling that we had not done the best possible thing.

Only recently there was a debate on the expansion of Chandigarh, something that we had said will not take place as Chandigarh was to be contained within a certain boundary, for town and country planning reasons, aesthetic reasons and so on. But we found that since Chandigarh was a Union territory and the features of the town were not to the satisfaction of either Punjab or Haryana, they started their own satellite towns in the neighbourhood and they acquired good lands and, it struck me, too late of course, that we could have based the whole town on rocky land, which is of no agricultural use, where the present cantonment of Chandigarh is. They are doing very well there because living conditions in those areas are better—the drainage is good and you can grow trees as there is enough soil for that. Similarly, Faridabad could have been built on the ridge, on the rocky ground higher up rather than on the most fertile land. This is happening everywhere. Towns are expanding on the best land as they are so planned. This is a third element to be looked at in land and water management, and this is something which can be easily changed. In Britain there is a law which says that the best land will not be built upon at all. They have to, willy nilly, choose second grade soil for expansion.

FERTILISERS AND OVER-CULTIVATION

The fourth threat to our soil resources is in respect of over-application of fertilisers and over-cultivation of best soils. Here I am talking about soils of Punjab, Haryana, Western UP, Gujarat: wherever you find best yield, the best irrigation, because it is here that we are taking two or three crops in a year.

FLORA AND FAUNA

I think I have said enough about this first item and will go rapidly into the others. The second area of concern which was identified by the Tiwari Committee related to natural living resources, the flora and fauna, many species of which are under great threat. The major species about which there is a hue and cry are the Tiger and the Rhino and thank god something is being done to save them.

Scientists and genetists are really worried about something that most people know very little about. They feel that we have not yet identified, labelled and named all the various species that exist in nature, whether botanical or zoological, insect-life, bacteria life, plant life, we have not identified them all, particularly in the tropical forests.

As you know, there are various qualities inherent in genes. We find, for instance, that a wild lemon might have certain disease resistant qualities which, if it is grafted into the gene of an average tree, might make it resistant to some disease. Therefore, it is very necessary that genes should be protected, as there may be actual genes which may have a great ability to fight disease, human disease or animal disease, so it is absolutely necessary, our scientists tell us, that we should keep certain portions of the earth apart in its pristine state, untouched by human hands, so to say, unspoilt by human activity, may be small portions, and wait for the future to tell us what we might get from the area. A typical example is the controversy about the silent valley. This is a tropical rain forest about the content of which we are not fully aware.

This is the main thrust behind the concern for the preservation of living natural resources, and this is therefore Item

No. 12 in the Tiwari Committee Report and what they recommended is that we should have biosphere reserves, as they are called, which should be preserves of nature which nobody should be allowed to exploit for any reason whatsoever. Handling and management of sanctuaries should also be much better than it is today, it is not at all good, according to the Report, and according to the information we also have. Although we call a place a sanctuary or a National Park or a Reserve, or whatever but people go in and out of it freely. They poach wild life though there is not enough, and even forest activities take place. Animals go there and graze, men also go there to chop and cut. All this has also to be attended to.

POLLUTION

The third area of concern identified by the Committee refers to pollution. Pollution by industry mainly. I don't have to say very much about it, as you all very well know that the big chimney belch smoke which is highly polluting and also the liquid effluent from various factories is highly toxic, it smells, it is obnoxious and it spoils the water and land. All this has to be controlled. Now these are matters which you can attend to fairly simply compared to what I mentioned earlier, for all that you have to do is to get hold of the persons who own the factory or plant, and they can clearly be identified, and you can tell them that you have to put this right within a period of time or you would be visited by fines, or the government will do it for you and recover the money. There are many ways, for you could even close it down, you could shift it somewhere else, and new factories you can control straight away, as we are going by getting assessment reports to be made of the environmental impact of every new project. We don't let the factory come up unless we are satisfied that there are built-in arrangements to deal with pollutants.

There is another matter, which concerns big cities, that is the pollution of air by motor vehicles. Again, I feel that through law this is easy to control if we have the political will. Every motor vehicle can be penalised if they permit

exhaust beyond a certain limit to go out. This is a matter of political will, but the mechanics are not so difficult, as other countries have tried it out and it is manageable. It's not like land and water, which is a field so far no one has tried to handle.

HUMAN SETTLEMENTS

Then, fourthly, the Tiwari Committee said that an area of concern was human settlements. In the time available to the Tiwari Committee it was felt that they could not specify what exactly they wanted to be done in the human settlements. There are problems of slums, over-crowding, very poor housing, insanitation, no parks for the people for recreation, no transport, life is miserable, the quality of life is so poor in these *Jhuggi Jhonpris* and other areas that what is really a wonder is the capacity of the Indian people to survive against all odds. A word that can't be translated, the word 'ढीट' (Dheet). You know when somebody refuses to die, we say 'ढीट है'. That is the kind of quality we find in the people who are surviving.

Also, the Indian mind is most disinterested in anything outside itself. I know many people who have quarrelled with me and quote the *Shastras* and I know that our literature is rich in the highest kind of thoughts, but in actual practice the Indian mind is so self-centred that we are not bothered about anything which pertains to our community, and that is why we have a lot of problems unsolved because the quality of life we want would mean that we start taking interest in things that are around us. But we have our gaze turned inwards, I am afraid. We can have a separate seminar on that, It's too big a problem to be mentioned here.

Coming back to the Tiwari Committee, of human habitats they said that it is such a problem that we will not go into any detailed discussion but just say we need another high powered committee to go into this problem. So, without meaning to be facetious, let me tell you that a high powered committee was created and they said that to come to grips with the problem we want seven different task forces which would cost so much (quite a lot of money) and it would take

some years before the task is complete.

Of these four areas, the fourth one was left undetermined and vague and they said that in order to get some basis for any action, you must get people informed and educated. So they identified the fifth area—Environmental Awareness and Education. That means you catch them young and start teaching children. Of course it is quite true that if our present generation had been better educated in these matters we wouldn't have committed so many of these mistakes.

So, we must catch them young as far as the future is concerned. We must also pay attention to the elders—those who have passed out of school and college and you have to educate them in some way through seminars and exercises like the one Prof. Shekhar Singh is organising here today.

The Tiwari Committee, as such, identified these five areas of concern. Finally, when this matter had to be placed before the national committee, we thought it would be a good idea if we could agree on some concrete programmes so that we make the thinking more concrete and less abstruse and less vague and less difficult to put your finger on, so to say.

Therefore, in the paper which I have circulated*, I have reproduced what the National Committee agreed upon as the minimum environmental programme for the country, which is the minimum which has to be accepted by the states. But the states always add other things, for example in Jammu & Kashmir it is the Dal Lake, which is exercising them very much.

Briefly, I would say that the Himalayas, Western Ghats and the N.-Eastern States should be reforested and checked from further denudation. We must contain and in due course reclaim the Rajasthan Desert. It's a tall order, but it's good to at least mention it somewhere. Ten years later somebody might have the courage to actually do something about it.

Second, the protection of valuable agricultural land set in by water logging in the commands of major irrigation projects, and the protection of good agricultural land against diversion to urban uses, and against over exploitation through

*Appended.

over cropping. Next, we go to parks and wild life sanctuaries and biosphere reserves and then pollution control from industries and then human settlements.

Now, human settlements is something on which I would like to spend a little time. We said that there is no use waiting endlessly for reports of other experts, the facts stare us in the face and they have never been mentioned because we never got these facts mentioned in any western literature. I am sorry to have to say that that is an example of our mental slavishness.

We must look at Indian problems through Indian eyes, and exercise our own minds and the first thing in human settlements that strikes me is that the blessed places are extremely filthy. It is all right if you are staying in nice suburban areas or in civil lines or housing colonies which are well built. But you step out of that ivory tower into old Delhi or beyond the Jamuna, or Kanpur or any place or even Bombay now, and the place is full of shit! Nobody will listen to this—we are so delicate, so gentlemanly, we won't mention these things and we are also often not aware of it because the elitist group that we all represent is thoroughly alienated from the life of the people.

Way back in 1972, when we first started discussing these matters, there was a meeting of learned people including the then Cabinet Secretary, Shri Swaminathan, and we were asked to give some views about environment. I was in the group and I happened to mention this word. I said, Mr. Chairman we must also deal with the problem of shit! Dead silence! nobody wanted to hear it. I reminded them that we live in filth. Take our villages, anyone who comes from there or who is familiar with the conditions, and I am sure that most of you are, would know that the whole place is not only full of animal dung and animal excreta, but of urine. We will not even admit that there is such a problem and the environmental literature, till we put it in now, did not contain a direct reference to this and in so many words. Still, you have got to deal with this mess.

DRINKING WATER

The second thing is the lack of good drinking water. You see people drinking from ponds! Even today! Even beyond the Jamuna (I will take you there right now if you want).

The other day I went to a place off the Jamuna. Horrifying to see men and animals drinking from the same pond. So we said of human settlements, we must not be too ambitious and talk of land use and land index, or floor index SSI (phrase made famous in Bombay by Mr. Antulay), and let's not talk of transport, buses, these are endless things, which you would never come to grips with. Let us talk of what the UN has to say: "This is the decade for drinking water and sanitation", and try and put that idea in. That, I feel, is a big enough job. What happens in the villages and what happens here, you all know. In the village all that stuff goes into the village pond and animals and men drink it. We don't have good water there. The thing gets powdered and the wind comes and blows it into your eyes, mouth, and into whatever you are eating or drinking. We have developed such immunities that we are living, but foreigners and tourists fall ill on the very second day and I don't blame them. They are not used to it.

So I think this matter is also important, in talking of human settlement. Many other things are also there but, to begin with and as a minimum programme, let us agree to at least these two items.

CONCLUSION

Finally, of course, environmental education and awareness. This is how the matter stands, and of course somewhere or the other here, which you will find, we have included a reference to the need for control in the handling, use, import, production, etc., of toxic materials.

For instance, you must have seen the newspaper reports about Kesari Dal—this should become an environmental concern. It should not be allowed to be grown, because its crippling people. So we had drawn up a kind of minimum programme, to start a debate. We are not competent to lay

down the law. The Committee can only say that in our view this is important and we have therefore said that this should be thrown open to public consideration and debated on as wide a scale as possible. I wouldn't go any further in these matters (it's all written down there). But what I have said is that if you want to implement these things, you will have to involve the government agencies. You can partly depend on do-gooders, and on the very enthusiastic boys and girls who will, I hope, keep on acting as gad flies and making life miserable for everybody who wants to be at ease. That is the role of the people, especially those who are motivated, and they should never let go. But the government will have to act in many of these things, and will have to create organisations which can and will have the authority to tackle problems. The centre will have to play a big role because the states unfortunately, are even more pre-occupied with political matters than the centre is: creating an environment for the environment is not easy, as a minister of the UP Government said to us quite frankly the other day. He said: "Bhai Saheb, there is no environment for the environment." (I thought that was a very good phrase). How to create that environment for the environment is a thing which concerns everybody because we are only at the moment scratching the surface of the problem. We have very very far to go, we are only discussing the issues, and I think I would leave it there and give some time for discussion. □

SYNOPSIS OF THE KEYNOTE ADDRESS

HISTORICAL BACKGROUND

As in many other countries, environmental planning took formal shape in India as a consequence of the Stockholm Conference. The Preparatory Committee for this Conference, which did much valuable work in identifying the areas of environmental concern to the country, was in fact the precursor of the National Committee on Environmental Planning and Coordination (NCEPC) which was set up in 1972 and has continued till the present day with some minor changes in its constitution and nomenclature.

It is a measure of the success achieved by the NCEPC in creating a consciousness for the environment that the election manifestos of all major political parties for the 1980 General Elections contained pledges to protect the environment and maintain the ecological balance. One of the first steps taken by Mrs. Gandhi after her return to power in January 1980 was to set up a high level committee, under the chairmanship of the Deputy Chairman of the Planning Commission, to recommend the legislative and administrative measures necessary for ensuring environmental protection. The Tiwari Committee, as this Committee is popularly known, made a number of far-reaching recommendations, the most important of which related to the setting up of a Department of Environment at the Centre under the charge of the Prime Minister herself. This recommendation was accepted and a Department of Environment was duly constituted towards the end of 1980.

The significance of the Tiwari Committee report lies as much in what it recommended by way of institutional arrangements to tackle environmental problems as in its analysis of major environmental issues confronting the country. It laid great emphasis on the need for the proper management of the country's natural resources of land, forests and water in order to conserve the nation's ecological base and recommend-

ed that a Central Land Commission should be set up as a first step to achieve this goal. It is gratifying to note that this recommendation has since been accepted by the government and that steps are being taken to implement it. The Tiwari Committee also identified three other areas of concern, namely, the need to preserve threatened species of flora and fauna and fragile ecosystems from extinction, the need to protect the pollution of air, water and land by industrial effluents and wastes and the need to improve the condition of our human settlements. The Committee also stressed that in order to achieve these objectives it would be necessary to improve the level of environmental education in schools and colleges and to enhance the awareness of environmental issues among the people as a whole.

Another far-reaching recommendation of the Tiwari Committee related to the reconstitution of the NCEPC into the National Committee on Environmental Planning or NCEP in short. This thirty-member body which came into existence on April 1, 1981 and is charged with the responsibility for overseeing the entire field of the environment and advising government on all policy matters relating to the protection and improvement of the environment, includes the Secretary of the Department of Environment and five other secretaries to the Government of India, besides eight senior officials and sixteen eminent non-official environmentalists.

IDENTIFICATION OF A MINIMUM NATIONAL PROGRAMME

The environment is a subject so vast in scope and so complex in character and we are so little prepared to handle it that it would be extremely unwise, *at this stage*, to bite more than we can chew. If any worthwhile results are to be achieved, if loose thinking and confusion are to be avoided, and the credibility of environmental programmes is to be established, it is of the utmost importance that we should have a highly selective approach towards the numerous problems which face us, and choose only such priority areas for immediate attention, as do not admit of any further delay. The adoption of a set of concrete and well-defined objectives

will also help us in communicating our concern for the environment to others and enable them to appreciate what role they are expected to play in the formidable task of achieving these objectives.

It would be useful to adhere to the 5-point framework of the Tiwari Committee report for the purpose of identifying, within each subject area, such programmes as need to be taken up without further loss of time. According to this approach, the following items would seem to merit inclusion in a minimum programme for environmental protection at this stage:

I. Land and Water Management

- (a) The protection, through suitable afforestation and soil conservation measures, of the most highly threatened mountainous areas in: (a) the Himalayas, (b) the Western Ghats, and (c) the North-eastern states. Such protection is a matter of the utmost urgency because the unchecked denudation of these areas constitutes a most serious threat to the productivity of the soil, our dwindling forest resources, and our irrigation and hydel potential, besides being the cause of colossal annual losses by way of floods and droughts.
- (b) The containment, and in due course, the reclamation of the Rajasthan desert through afforestation and other anti soil-erosion measures.
- (c) The protection of valuable agricultural lands which are threatened by water logging in the commands of major irrigation projects. (Since prevention is better than cure, the reclamation of the 13 million hectares of land already lost to waterlogging and salinity, must necessarily be taken up at a later stage.)
- (d) The protection of good agricultural lands against diversion to urban uses.

II. Natural Living Resources

- (a) Stricter and more scientific management of the existing 19 national parks and 202 wildlife sanctuaries.
- (b) Conversion into biosphere reserves of representative small ecosystems, both terrestrial and marine which

are particularly valuable from the point of view of genetic diversity.

III. *Environmental Pollution*

- (a) Control of pollution—of air, water or land—caused by major public sector industries such as steel, cement, power, paper, refineries, petrochemicals, etc.
- (b) Control of pollution—of air, water or land—caused by privately owned industries which contribute significantly to environmental pollution in the major industrial centres of the country.
- (c) Control of air pollution caused by motor vehicles. Such a measure is also necessary in the interest of fuel conservation and the better maintenance of transport vehicles.
- (d) Carrying out of environmental impact assessment studies in respect of all new major industrial and other projects.
- (e) Control on the import, production, use and handling of such toxic and nondegradable chemicals and wastes which are considered to be specially dangerous for the environment and plant, animal and human food systems.

IV. *Human Settlements*

- (a) Launching of a nation-wide campaign against insanitary and unhygienic conditions. Initially, state capitals but thereafter district towns and even smaller towns and villages may be taken up under a national cleanliness drive. This will involve the construction of large number of public latrines and the introduction of better waste removal and disposal systems which should be linked as far as possible to biogas plants and other means of waste utilisation and recycling.
- (b) Introduction of suitable methods for providing safe drinking water to such rural and urban areas as cannot be served by piped water.

V. *Environmental Education and Awareness*

- (a) Formulation and implementation of a sustained media campaign for inculcating among the general public a greater awareness of environmental issues.
- (b) Modification of educational curricula to promote environmental awareness amongst students.

It must be pointed out that even though this 15-point list has been kept as short as possible, it represents a colossal challenge which, even with the best will in the world, it will take us years if not decades to meet.

It is absolutely essential that such a list should find unreserved acceptance both at political and popular levels for the simple reason that such far-reaching programmes cannot be carried through in the absence of a very strong political will as well as popular support. It is accordingly necessary that this programme should be thrown open for public consideration and debate on as wide a scale as possible.

PROBLEMS OF IMPLEMENTATION

Assuming for the moment, that such a minimum programme will find general acceptance, the next question to which we must address ourselves is as to how it is to be implemented. It will be seen that in almost all cases legislative as well as executive responsibility for the translation of this programme into action rests with the states. The states must accordingly be persuaded to give the necessary priority to these items. This is a responsibility which can and must be shouldered only by the concerned central ministries. The ministries must also, of course, accept responsibility for such work as needs to be done at their own level.

The central ministries responsible for each of the fifteen items in the suggested minimum programme are as follows:

<i>Item</i>	<i>Ministry/Department</i>
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- | | |
|------|-----------------------|
| Item | I (a) Agriculture |
| | (b) Agriculture |
| | (c) Irrigation |
| | (d) Works and Housing |

- Item II (a) Agriculture
 - (b) Environment (as recommended by the Tiwari Committee)

- Item III (a) Works and Housing, acting in collaboration with Finance (who are incharge of public sector industries)
 - (b) Works and Housing, acting in collaboration with Industry
 - (c) Shipping and Transport
 - (d) Environment (as recommended by the Tiwari Committee)
 - (e) Environment

- Item IV (a) Works and Housing
 - (b) Works and Housing

- Item V (a) Information and Broadcasting
 - (b) Education

It will be seen that, apart from the Department of Environment itself as many as eight central ministries will be involved in the implementation of such a programme. It is obviously necessary that each of these nine organisations should accept responsibility for the item(s) shown against them and draw up viable time-bound projects in consultation with the state governments concerned. *For obvious reasons, all possible efforts should be made to achieve the maximum public support for such projects and to make them, wherever possible, economically self-sustaining and even profitable.*

It must be made clear, in this connection, that the states will be naturally free to take up such other environmental programmes as they feel are necessary in the light of their local conditions.

THE ROLE OF THE CENTRE

In order to activate the ministries in this respect and provide much-needed political direction and support to environmental programmes, it is necessary that immediate steps

should be taken to set up a Cabinet Sub-Committee on the Environment, as recommended by the Tiwari Committee. This Committee should be presided over by the Prime Minister who is also Minister for Environment.

The role of the Cabinet Sub-Committee in directing and over-seeing environmental programmes will be obviously crucial, as it will represent the highest political authority in the land. In view of the fact that environmental programmes are, by their very nature, non-political in character and that the minimum programme under discussion is very likely to represent a national consensus on the subject, it may be found useful, at a suitable stage, to convert the Cabinet Sub-Committee on Environment into a National Environmental Council by including in it the leaders of the more important national political parties. Such an arrangement will help in mobilising the maximum possible public support to, and participation in, environmental programmes—which in fact must acquire the character of a national movement if they are to succeed in achieving the “greening and cleaning” of India.

CONCLUSION

Although a very great deal still needs to be done and the tasks before us are of a most formidable nature, it needs to be mentioned that appreciable progress has been made in certain directions. All new major development projects are subjected to environmental impact studies and are cleared for execution only after the necessary environmental safeguards have been incorporated in them. An Act for the Prevention and Control of Air Pollution has been passed in March 1981 and implementation has been entrusted to the Central Board for the Prevention and Control of Water Pollution which has been in existence since 1974. Social forestry schemes aimed at the afforestation of denuded areas are being taken up on an increasingly large scale by various state governments and a fairly high level of public awareness of the consequences of the degradation of our land and forest resources has been achieved, even though there is no comparable awareness with regard to the need to control pollution and improve

sanitary standards in our towns and villages.

To sum up, it would be correct to say that although we have so far done nothing more than touch the fringes of the problem, there is every reason to hope that given the requisite political will, we shall be able to register really significant gains on the environmental front in the coming years. ☐

ABSTRACT OF DISCUSSION

Many participants reiterated a point that Shri B.B. Vohra made, of time being of the essence. If some measures were not taken urgently we might face, in certain areas, irreversible ecological damage. This was seen to be specially true for our land resources and every body urged the necessity to look at these resources on a priority basis.

The inter-relatedness of the different dimensions of ecology was also stressed and it was pointed out that one could not preserve the ecological system by ignoring any one part of it. For example, whereas the lion-tailed macaque might not in itself be very important, however, it is not only an essential part of the ecological chain but its existence and well-being are litmus tests for the well-being of the forest system within which it lives.

Regarding forests, it was pointed out that one could not replace natural forests. This is primarily because we have no precise idea of the complete relationship between the fauna and the flora, on the one hand, and between different types of flora, on the other, that exist in our natural forests. As such, at least till our knowledge improves, we must preserve some of our natural forest systems. It is not enough to feel that we have planted as many trees as we have cut down.

It was stated that in using chemicals as pesticides and insecticides, one has to be very careful, for sometimes each chemical might in itself be harmless but when combined with one another they might have serious effects on health and environment.

It was stressed that environmental education ought not to be only theoretical, for without practical application and visits to the field, very little could be achieved.

Regarding the preservation of wildlife, it was asked whether wildlife should be protected only because of its use to mankind? Should we not concede that animals also have a right to exist in this world, irrespective of their use to the human race?

It was generally felt that one of the most important problems faced by the country today was the problem of deforestation. This had both ecological and socio-economic implications. The cutting down of the forests interfere with weather patterns, levels of air pollution, soil, water run-off rates and various other ecological functions. Rampant deforestation also meant that many of the people who were totally or mainly dependent on the forests for their livelihood or for fuel would be deprived of their basic needs.

One of the main causes of deforestation was the increasing commercial and industrial use of forest resources. This led to a smaller and smaller number of people consuming a larger and larger proportion of our forest wealth, the forests being mainly in the rural areas and the consumers being mainly in the urban areas. Another cause of deforestation was the use of forests as a source of fuel, by the poor people living in and around these forests.

Among the solutions that were envisaged, it was felt that the question of commercial and industrial use was really a political question and could only be tackled as such. However, some minor changes could be made which could ensure a more rational use of our forest resources. One of these changes was envisaged to be the replacement of forest contractors by government agencies. However, it was also argued that this did not seem to have made any difference, and in many cases the government agencies are behaving more irresponsibly than the contractors did. The tapping of trees for resin was also seen as a cause for damage to the forests, and should be controlled.

Another aspect that needed attention was the design of *chullahs* for use in rural areas. If better and more efficient *chullahs* could be designed the result would be the lowering of the consumption of fuel wood as also lesser health hazards for the rural women.

It was felt that there was not enough publicity given to environmental issues and that various forms of media, including regional radio stations, should be involved in this effort.

It was argued that it would be realistic to expect the state governments to look after their forests, only if the central government compensated the state for the loss of revenue

because of under-utilization of the forest wealth.

However, this was also disputed, for some people felt that the state should be as concerned about its forests, its people and its environment, as is the Centre.

On the extreme, it was pointed out that very often over-zealous environmental protection can be at the cost of the poor people and disruptive to their modes of livelihood. Cases of various wildlife sanctuaries were cited in support of this point.

It was considered essential to study, in detail, the impact of pesticides and of different species like the eucalyptus, before they were introduced in a large scale.

The concept of mono-culture was opposed and various advantages of mixed plantations were stressed. It was pointed out that both from the ecological point of view and from the point of view of the people who live off the forest, mixed plantation was essential. Tribals, for example, use different parts of different trees for different purposes.

The plantation, in a large scale, of eucalyptus trees was vehemently opposed. Among other things, it was pointed out that the eucalyptus offers no shade to the people and does not have any flowers or fruits which would support the avi-fauna.

Education regarding environmental matters, it was felt, should be taken up at school level and rather than bookish education, school children should be taken out to the wilds on field trips as part of their education. Though it was pointed out that some of the schools might not be able to afford such facilities, the general consensus seemed to be that the government and other interested agencies should make such trips financially possible.

It was also felt that there should be a compulsory course at universities and for executives, administrators and professionals on the essential aspects of the environment.

There was a lengthy debate on the question of water pollution and on the role of the industry vs. domestic use in terms of their responsibility for causing water pollution. Some people felt that, in terms of quantum and potential hazards, the pollution caused by the municipal use of water was much greater than that caused by industrial. How-

ever, this was disputed and, it was argued that though the mass of pollutants coming from domestic use were greater, however, industrial pollutants, though smaller in quantity, were much more toxic and posed a much greater health hazard.

It was felt that unless the common man was allowed to file cases, against water and air pollution, in the courts of law, not much headway would be made in terms of pollution control.

Discussing the problems of deforestation further, it was pointed out that unless industries which were wood based were encouraged to convert to other sources of raw materials, it would be impossible to save the forests. The cases of the Gir Forest, in Karnataka, and most of the Himalayas, were cited as examples of this form of exploitation.

It was also felt that we should not blindly follow the western model of industrialization, which leads to mass production instead of production by the masses! The case of sandalwood, in Karnataka, was cited where, because of setting up of sandalwood oil factories, not only were the sandalwood forests denuded but thousands of poor people who subsisted by making sandalwood carvings, lost their source of livelihood.

It was felt that unless there was a global policy regarding the use of our natural environment, we could not possibly have an effective national policy. A global policy became all the more essential because of the unequal consumption of our resources where, for example, the USA with only about 6 per cent of the world's population consumes more than 50 per cent of the world's energy resources.

It was pointed out that various efforts have been made to formulate what could be considered a global policy for the environment. For example, the Stockholm Conference was an effort in this direction. However, whatever global policy there might exist could only be recommendatory in nature. As such, each state would have to formulate a national policy not only in keeping with the global requirements but also incorporating its specific detailed requirements.

It was mentioned that there are over 300 treaties regarding the environment and starting from the 1920s. However, they

do not seem to have had very much of an effect.

Whatever be the environmental policy, it was felt that the needs of the people must always be considered paramount and all technology, and strategies for development, must be geared around this priority.

The need for solving the fuel and fodder requirements of our masses was stressed again and again. It was felt that unless we seriously investigate the plausibility of planting a multiplicity of species of trees, we cannot adequately tackle this problem.

Some people felt that in most seminars, as in this one, the stress was usually on the Himalayas and the Western Ghats. However, one should not forget South India and the forests and other natural resources existing there.

The problems regarding tribal regions were also highlighted, especially as most of the tribals were known to be predominantly depending on the forests for their livelihood and as such most severely affected by any denudation of the forest cover. Along with this, many of the tribals also practised shifting cultivation, which seemed to be harming the environment in general and forests in particular.

The issue of sanctuaries vs. people was also raised and it was argued that though the setting up and maintenance of sanctuaries was obviously desirable, however, it must be ensured that adequate care is taken to meet the basic needs of the people who live around the sanctuaries.

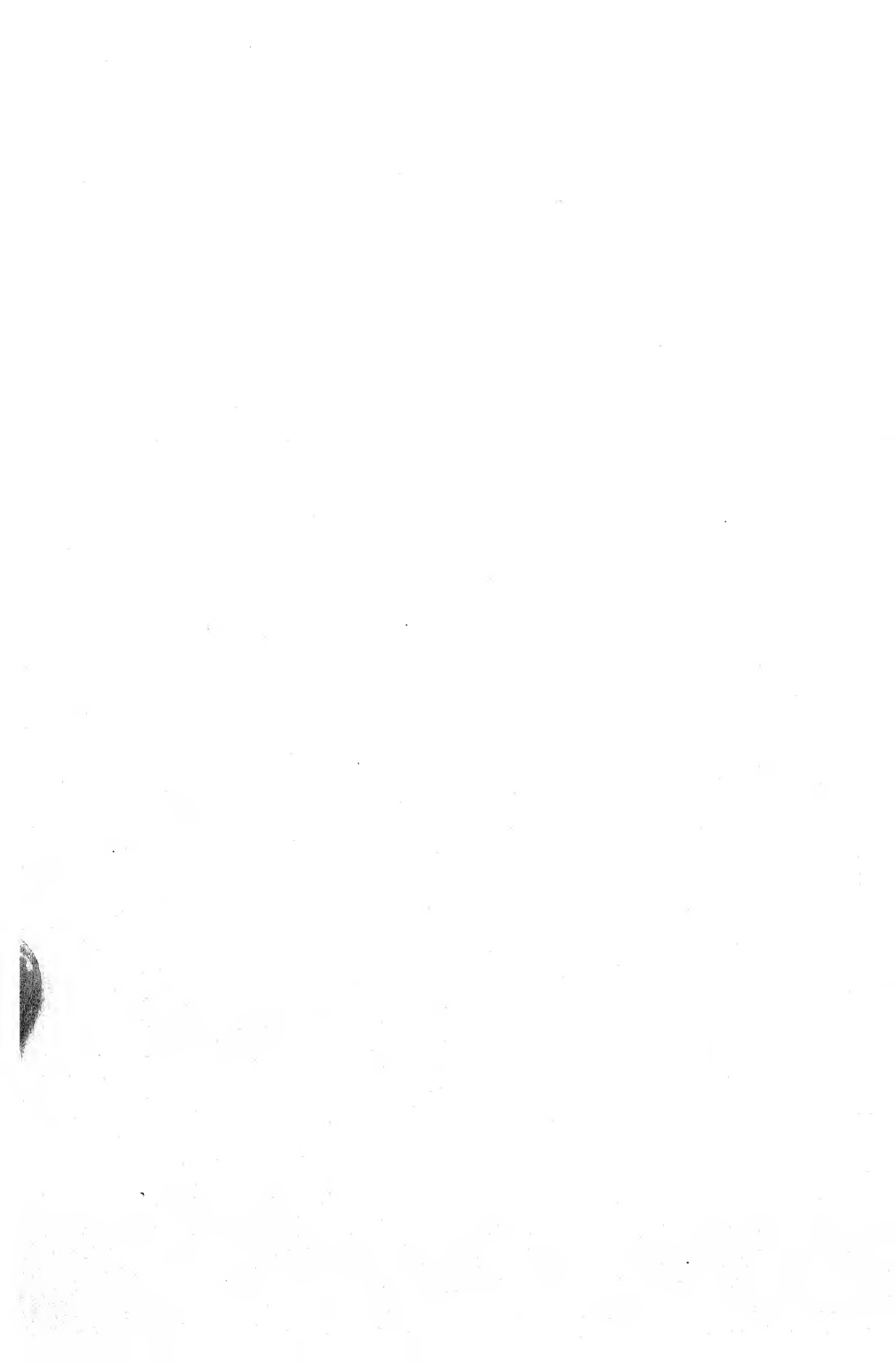
There was a suggestion that considering India was importing a large amount of edible oil, serious consideration should be given to promoting oil seeds plantation.

One of the problems, it was felt, was the lack of scientific knowledge and methodology for understanding and tackling certain environmental issues. Priority should be given at developing these aspects and at briefing all the concerned people about such methods and techniques.

The problem of shifting cultivation, it was argued, was not really as serious as it was made out to be, as it affected only a very small proportion of our forest area. However, it was seen as a social problem brought about due to causes like the unavailability of proper land for cultivation in the normal manner.

The loss of our top soil, which was calculated to be about 6,000 tonnes per year, was seen to be one of the major and urgent problems that needed to be tackled. It was not clear how this loss could be prevented. □

SESSION II



INDIA'S ENVIRONMENTAL POLICIES: A REVIEW*

O.P. DWIVEDI
B. KISHORE

On the one hand the rich look askance at our continuing poverty . . . on the other, they warn us against their own methods. We do not wish to impoverish the environment any further and yet we cannot for a moment forget the grim poverty of large numbers of people. Are not poverty and need the greatest polluters?

INDIRA GANDHI
UN Conference on Human Environment
Stockholm, 1972

Environmental pollution problems, especially those which resulted from afflicted water causing diseases, were identified by the beginning of this century. However, so was a relatively cheap and safe way of treating the drinking water . . . by chlorine. The industrialised nations suddenly faced severe health and recreational dangers from various industrial and consumerism activities of the people. It is not as if the environmental problems emerged all of a sudden from nowhere. The increased industrialisation and urbanisation did saturate the assimilative capacity of the environment, and problems became more visible. Realizing the transnational characteristics of these

*Some portions of this paper have been drawn from:

- (a) "India Pollution Control Policy and Programmes" *IRAS*, Brussels, Vol. 43, 1977, pp. 123-133; and
- (b) "Protecting the Environment from Pollution", *Asian Survey*, University of California, Berkeley, September, 1982.

problems, the United Nations established a Scientific Advisory Committee in 1968 to consider the question of holding a conference on human environment—later held in Stockholm in June 1972. While all industrialised nations showed their enthusiasm for it, most of the developing countries remained sceptical about its value, believing that the problem was largely an affliction of the industrially developed societies and since the developing countries were not as much industrialised and urbanized, the problem could be tackled in its own time. Reports produced by environmental groups of some industrialised nations predicted doom for mankind and suggested 'no growth' policy as a viable method of protecting the biosphere. This was considered by some developing nations as a conspiracy by the industrialised countries to control the process of industrialisation, thus decelerating the efforts of developing countries to remove poverty. These sentiments were generally shared by the developing countries present at the 1972 Human Environment Conference at Stockholm. The Indian Prime Minister, Mrs. Indira Gandhi, while addressing the Conference, stated:

The environmental problems of developing countries are not the side effects of excessive industrialisation but reflect the inadequacy of development. The rich countries may look upon development as the cause of environmental destruction, but to us it is one of the primary means of improving the environment for living, or providing food, water, sanitation and shelter; of making the deserts green and the mountains habitable.

The Prime Minister also emphasized that for a vast majority of the world's population, degradation of the environment is not merely a question of pollution generated by industrial activity; rather it embraces the whole concept of the quality of human life. The destruction of forests, erosion of soils, the dereliction of lands, the loss of wildlife, the accumulation of wastes, the plight of urban areas, these are all examples of the degradation of the environment, just as much is the pollution of air and water. And so are disease, squalor, hunger.

malnutrition and all the other companions of poverty. Consequently, the concept of environment in a developing nation brings a vision of a society where human settlements (both rural and urban) would be healthy, drinking water will be easily accessible and free from disease-carrying germs, sanitary conditions will be of an acceptable level, and society will be able to provide opportunities to its members to live in dignity. Developing countries ask: is it the industrialisation which will help to materialise this vision? If so, then no growth or controlled growth policy as advocated by people of some industrialised nations could certainly leave the developing countries poorer. Therefore, the first emphasis ought to be on preserving and sustaining the life and then on improving the quality of life.

These views are now a part of the basic environmental philosophy of the Government of India. The Prime Minister, speaking before a gathering of distinguished Indian Scientists on January 3, 1981, said: "Development with conservation means that growth priorities do not sacrifice the needs of tomorrow for immediate compulsions Poverty and economic backwardness are themselves constraints to growth." Thus, the government policy pronouncements and related administrative set up, are oriented toward development with conservation.

THE ENVIRONMENT AND THE CONSTITUTION

India is one of the very few countries of the world which enshrined in its constitution a commitment to environmental protection and improvement. Although some provisions in the constitution in the area of improvement in the quality of life existed since its proclamation in 1950, a direct reference to environmental protection and improvement was introduced with the Constitution (Forty-second Amendment) Act of 1977. It has interjected a new dimension to public responsibility by obligating the central government to protect and improve environment for the good of society as a whole.

Article 48A, inserted after the Constitution (Forty-second Amendment) Act in 1977, makes a specific reference to environmental protection as an obligation of the state and men-

tions:

The state shall endeavour to protect and improve the environment and to safeguard the forests and wildlife of the country.

Although, the term 'environment' has not been defined in the constitution, it could be interpreted in a broad manner as the quality of the physical-natural environment...the air we breathe; the water we drink and use for recreation; the land we cultivate, mine and build on; and the wilderness we seek to enjoy today and to preserve for future generations. Thus this provision covers the entire spectrum of environmental degradation. The words 'protect' and 'improve' are also very meaningful in the sense that the state is obligated not only to endeavour to preserve the environment in whatever degraded form it is at present but also to improve its quality. It provides a positive and dynamic connotation, so that the state may deliberately take steps and impose restrictions on the use of resources which adversely affect the environment. It further clarifies that the state is not obligated to protect and improve the environment, but merely shall endeavour to do so.

Akin to other federal states, India's national environmental policy must take shape within the context of divided jurisdiction between the federal and state governments. In addition, historically, several ministries and departments claim to have necessary jurisdiction on certain aspects of environmental problems and natural resources management. For example, while article 253 of the constitution empowers parliament to make laws to give effect to international agreements and conventions and to harmonize national legislations in conformity with international agreements and conventions (valid for all or any part of the territory of India), there is no provision in the constitution which enables the union government to enact laws pertaining to environmental issues uniformly applicable to all the states. At present entries in the constitution are liable to generate jurisdictional problems between the central and state governments. For example, while the regulation of inter-state transportation (especially railways and

national highways), shipping and navigation, exploration and extraction of mineral resources, and atomic energy fall within the jurisdiction of the federal government, the state governments have legislative authority for ownership, management and the use of natural resources such as water and land. In addition to the separate federal and state jurisdictions, there exists a concurrent list of legislative powers which includes items such as population control and family planning, social welfare, regulation of industries, forests and the protection of wildlife and birds. The concurrent list appears to give superior power to the federal government although state governments have executive authority over the management of those items. Given the constitutional situation, it is not surprising that policy and administration of natural resources and environmental quality have tended to be fragmented among the two levels of government, as well as among different ministries and departments of the national and state governments. Of course, the local governments are yet to be involved in these jurisdictional and managerial problems. However, the federal jurisdiction and its role over matters of natural resources and the environment is considerably narrower and more restrictive than that of the state governments. At the same time, the federal government can use its declaratory power in the name of national welfare, to 'impel' state governments to undertake pollution control measures, or to use its financial power (by allocating funds through Planning Commission and annual budgets) for instituting suitable actions. Also, the emergence of 'directed federalism' in India, which appears to have given functional supremacy to the federal government, allows the central government to undertake a leading role in achieving desired environmental objectives through fiscal incentives. Such a role can be further strengthened by suitably amending the seventh schedule of the constitution. This could be done by inserting a new entry in the concurrent list on the following lines: "Matters concerning protection and improvement of environment." The advantage of inserting this entry in the concurrent list is that both parliament and the legislatures of state governments will have competence to make laws in this regard; and then in view of article 254, if there is any overlapping

between union and state laws, the union law already has an overriding effect.

GOVERNMENTAL RESPONSE TO ENVIRONMENTAL CONCERN

The year 1972 marks a watershed in the history of environmental management in India. Prior to 1972, subject areas of environmental concerns such as sewage disposal, sanitation and public health used to be dealt with by different ministries of the Government of India and each one pursued these objectives without any proper coordination systems established at the federal or the inter-governmental level. When the 24th UN General Assembly decided to convene a Conference on Human Environment in 1972 and requested member states to prepare country reports on the state of environment, a Committee on Human Environment was set up by the government under the chairmanship of Pitambar Pant, Member, Planning Commission to prepare these reports. These reports indicated the need for establishing greater coordination and integration in environmental policies and programmes and thus a National Committee on Environmental Planning and Coordination (NCEPC) was set up in February 1972 in the Department of Science and Technology. The Minister of Planning, Science and Technology, in his introductory speech outlining the purpose of the creation of this committee remarked:

The main objective of creating the National Committee on Environmental Planning and Coordination is to secure the best advice available upon environmental problems and make recommendations for their improvement after careful considerations and detailed consultations with the various ministries and departments charged with the responsibility for environmental matters. An important aspect of this work will be the identification of environmental effects of activities programmed and recommending modifications to safeguard the quality of environment.

The NCEPC is an apex advisory body in all matters relat-

ing to environmental protection and improvement. At its inception the committee was comprised of 14 members drawn from various disciplines concerned with environmental management. Most of the non-official members were specialists. The committee, as such, was not given any executive functions but to plan and coordinate, while the responsibility for execution continued to vest with the various ministries and agencies of the government. It was expected that the success of NCEPC depended upon the level of cooperation that it could receive from other ministries and departments. The committee was serviced by the Department of Science and Technology and an Office of Environmental Planning and Coordination (OEPC) was set up. This office functioned under the direction of the chairman of the committee. Some of the important activities of OEPC were: (1) collaboration with the project appraisal division of the Planning Commission in developing guidelines for evaluating the relative costs and benefits of development projects that take account of environmental factors; and (2) formulation of proposals and coordination of research programmes on environmental problems.

During the course of time, the composition of NCEPC underwent significant changes. The committee is appointed for a two-year term. While the membership of NCEPC increased from 14 in 1972 to 24 in 1977 to 35 in 1979, the proportion of non-officials decreased. The membership has also become unwieldy and decision-making has become more complex. There has been greater bureaucratization of the committee with the addition of more secretaries in the committee. The first committee enjoyed good political clout, but this support has waned in the successive committees. Consequently, the element of willing cooperation from other departments appears to have decreased.

The OEPC originally consisted of experts in different disciplines and provided secretarial and technical support to the committee under the direction and supervision of its chairman. Since all these officials were recruited and employed by the Department of Science and Technology, and as NCEPC chairman had no administrative authority on these officials, they were inclined to look to the Department of Science and

Technology for control and accountability. The OEPC was subsequently dissolved to become an Environment Division of the Department of Science and Technology. This further weakened the position of the NCEPC chairman as the Environment Division for all practical purposes worked under the direction of the department. This dual authority pattern further eroded the expected performance of the environmental office.

Events did take turn for good of the environmental protection when on February 29, 1980, Mrs. Indira Gandhi appointed a Committee for Recommending Legislative Measures and Administrative Machinery. The terms of reference of the committee, under the chairmanship of N.D. Tiwari, were: "(a) To review the existing laws on the subject of environmental protection at the Central and State levels and recommend legislative measures required for ensuring environmental quality, (b) to review the existing administrative arrangements for the protection of the environment and to recommend improved administrative machinery for ensuring environmental protection, (c) to recommend appropriate and adequate machinery in government both at the central and the state levels for improving environmental quality and to maintain ecological balance". The committee reported on September 15, 1980, and one of its major recommendations to bring administrative sanity in the existing arrangements was: "A Department of Environment (DOE) should be created at the centre immediately to provide explicit recognition to the pivotal role that environmental conservation must play for sustainable national development." The Tiwari Committee further recommended that in order to invest the Department with the stature essential for achieving the purpose for which it has been recommended, "the DOE should be under the charge of the Prime Minister assisted by a minister at an appropriate level". These and several other recommendations were implemented immediately and a new Department of the Environment came into being on November 1, 1981. The Environment Division of the Department of Science and Technology became the new DOE, with the addition of only one more person in the professional/administrative category. Thus, for all practical purposes, the newly established depart-

ment is short of necessary personnel, which has certainly affected the productivity of the department.

If we examine the terms of reference of the national committee, we find that the Committee has been made responsible for almost all the activities relating to human environment and the department is charged with the functions of servicing the Committee. This department, with a complement of about a dozen of officers, finds it difficult to deal with the broad range of subjects concerning environmental management. The committee, being a purely deliberative body, is dependent on these officials to provide technical support and make agenda papers for its deliberations. As a result, the activities and functions of the committee, at times, are found to be inadequate. Further, since it has not been given any regulatory and monitoring authority, it does not have much clout to force its views on reluctant departments and corporations. While in the initial stages, the concerned departments did not hesitate to draw upon the expertise of the NCEPC in order to take care of environmental requirements, the passage of time found national will weakening, thereby making it possible for powerful departments to ignore its work. Moreover, the committee having acquired too many tasks to be handled effectively by its small group of officers, appears unable to provide necessary leadership and expected performance. As a consequence, the committee is slowly losing its effectiveness. Moreover, during the period 1975-1979 (but particularly during the rule of Janata Party, 1977-1979), the federal government commitment to protect the environment was slackened. However, immediately after returning to power, Mrs. Indira Gandhi provided strong leadership to revive interest in environmental issues.

Environmental Impact Assessment

The concern for preserving the quality of life and protecting the environment while undertaking the task for development was, for the first time, stressed in the Fourth Five Year Plan (1969-70 to 1973-74). This document recognized the need to introduce environmental protection concern into national planning and development. By the Sixth Five Year Plan (1980-85), this concern was turned into concrete actions

by launching several programmes relating to enhancement of the quality of life by incorporating environmental protection element in various developmental projects.

At present, there is no statutory requirement for environmental impact assessment in India. A new mechanism to protect environmental concern has been initiated which requires Planning Commission's approval to any major project with a review report by the Department of Environment. Similarly, in the case of a major industrial project being planned in the private sector which requires the federal government approval, the Licensing Committee of the Ministry of Industry will grant a licence for the installation of such an industrial facility after a review of the project has been done by the Department of Environment to ensure suitable provision for the prevention of environmental degradation. While this mechanism is still being tested, suggestions have been made to transfer this role to relevant regulatory and licensing ministries and departments. Exception to this will be those projects having significant environmental concerns for which the review will be done by the Department of Environment. Environmental concerns are informally incorporated into projects at the stage of conception, formulation, location, approval and implementation. The 'guidelines' to project authorities at the time of conception, formulation and location of projects, 'checklists' for making environmental impact assessment for approval have been issued. Safeguards are stipulated during the design, construction, and implementation of the projects. Guidelines and checklists have so far been developed for hydro-electric and irrigation projects, thermal power generation projects, industrial development projects, harbour development projects, mining projects and rail and road construction projects.

Environmental appraisal committees for assessing all major hydro-electric and irrigation projects, thermal power projects and industrial development projects have been set up. These committees review the impact statements prepared by the project proponents and suggest suitable safeguards required to be adhered to during the implementation of the project. Monitoring committees are also established, as and when necessary. If, in the opinion of the committee, detailed stu-

dies are required to be carried out, working groups or expert committees are set up for on-the-spot assessment of the project. The appraisal committees were sometimes, however, hampered in their assessment because of lack of scientific information like floral and faunal surveys, geological features, etc., and impact on them as a result of project implementation. The recommendations of the appraisal committee are examined by the Department of Environment and forwarded to the Planning Commission. Although such an appraisal tends to become bureaucratized and routinized and lacks innovation and fresh ideas, the bulk of sheer numbers precludes any other system of environmental assessment. There is no mechanism by which individual projects could be given a detailed treatment for incorporating public participation and for inclusion of environmental concerns in policies and programmes and legislative proposals at present existing in India. In most cases, the project proponents monitor the impact of their projects to the environment. In view of competing demands on the part of project proponents and also because of absence of any mechanism for surveillance and monitoring, the environmental consequence of such undertakings are seldom assessed, and generally ignored during project completion state or afterwards. During 1979-80, thirty hydro-electric and irrigation projects and fifteen thermal power generation schemes were appraised from the environmental angle and appropriate safeguards were recommended. A number of industrial projects were also referred to the Environment Division for comments with regard to environmental consideration.

Five Year Plans and the Environment

Since 1952 national programmes in sanitation, public health, nutrition, water supply and housing were given high priority but the issue of environment and development did not receive any significant recognition in the planning process until 1968. The Fourth Five Year Plan made the following observation:

Planning for harmonious development. . . is possible only on the basis of comprehensive appraisal of environmental

issues. . . it is necessary therefore to introduce the environmental aspects into our planning and development.

The Draft Fifth Plan (1974-79) stressed that there should be close association of the NCEPC with all major industrial decisions so that environmental goals are fully taken into account. The Plan stressed that pursuit of development goals does not cause a reduction in the quality of life through deterioration in environmental conditions by maintaining a link balance between development planning and environmental management. In this context, a number of programmes for enhancing the quality of life under the minimum needs programme (elementary education, rural health and sanitation, nutrition, drinking water, provision of house sites, slum improvement and rural education) received a fairly high priority. These were expected to minimize environmental pollution and degradation in the rural areas and achieve reduction in poverty levels.

In the Sixth Five Year Plan (1980-85) an entire chapter on 'Environment and Development' has been included which emphasizes sound environmental and ecological principles in land use, agriculture, forestry, wildlife, water, air, marine environment, minerals, fisheries, renewable resources, energy and human settlements. It provides a guidance to administrators and resource managers in formulating and implementing programmes and projects taking into consideration environmental aspects and lays down an institutional structure for environmental management in the central and state governments. Although the document is alarmist in approach, it provides a good basis for improvement in the already degraded environmental conditions in India. The section on "Ecology and Environment" in Sixth Plan mentions the following causes of the degradation of environmental quality: (1) there is no consideration of costs of environmental degradation at the policy making level; (2) there is lack of long-term perspective in our development planning; (3) all agencies tend to maximise their own profits and ignore the costs they impose on the society at large; (4) while a community depending on a resource for its subsistence generation after generation has a stake in its conservation, an entrepreneur with the option of

shifting his investment is only interested in quick profits even if it leads to the destruction of the resource base; (5) cultivation of marginal land, overgrazing depleted pastures, cutting wood from dwindling forests and destroying the base of our national resources to eke out a subsistence; and (6) damage of soil productivity and scenic beauty as a result of mining, brickmaking and similar activities. Finally, ecological assests are to be protected as one of the goals of the Sixth Plan.

Environmental Management in the States

At the behest of the NCEPC, almost all the states and the union territories have established environmental boards/committees with the terms of reference almost similar to the national committee. These boards/committees are chaired by the respective chief ministers because it was thought that chairmanship by head of government would give stature and executive authority to the boards. An official of the Department of Environment is invariably a member of the state boards/committees. This arrangement has been thought necessary to enable good liaison between the national committee and the state boards. These boards/committees are expected to perform the following major functions:

1. focal point for initiating, reviewing and monitoring all aspects relating to the environment in the respective states;
2. action relating to environmental education and creating awareness;
3. project appraisal at an early stage;
4. siting of industries and incorporation of environment safeguards for development projects; and
5. liaison with the Department of Environment/NCEPC and with other government departments' research and educational institutions, and industries in the respective states.

At present the state environmental committees or the state departments of environment lack necessary technical expertise. These administrative bodies suffer in their work and effectiveness due to utter paucity of staff. A further handicap

is the non-availability of funds or financial support for setting up necessary expert committees, visits to project sites, and the preparation of environmental appraisal of projects handled by state governments. The situation is really serious, in the sense that in most states, these environmental committees are not at all active. Financial stringency, coupled with inadequate attention being paid by state governments to the environmental departments/committees that exist is affecting the dedication and motivation of the centre's leadership and its officials.

Recent Political Developments

Until 1980, none of the political parties in India considered environmental pollution worthy for inclusion in their election manifestoes. Perhaps they viewed that the general public would not necessarily appreciate such aesthetic and finer elements of quality of life. However, when such controversies as preservation of Silent Valley and the Taj Mahal, brought on the surface the heightened public concern, political parties were quick to capitalize on it.

Initially led by the Congress-I, all major political parties, during the 7th General Election in January, 1980 had something to say on environmental protection:

Congress-I feels deep concern at the indiscriminate and reckless felling of trees and the depletion of our forests and wildlife, which upsets the ecological balance with recurring misery to the people and disastrous consequences for the country's future. Projects which bring economic benefits must be so planned as to preserve and enhance our national wealth, our flora and fauna.

.... Congress-I will take effective steps—including setting up in the Government a specialised machinery with adequate powers—to ensure the prudent use of our land and marine resources by formulating clear policies in this regard for strict implementation.

The Lok Dal stated that "... (it) will pursue a vigorous policy of protecting the environment. In the Himalayan region and the Western Ghats, a large imaginative programme will

be undertaken for afforestation, soil conservation and water management." The Indian National Congress (U) advocated not only protection of forests and wildlife, but more investment in afforestation schemes. The Janata Party took the view that the "country's natural resources. . . are being depleted at a pace that can only spell ecological and economic disaster within a foreseeable future. Therefore...drastic remedial action must be taken without delay. There is a need to arrest ecological degradation and to reverse and prevent desertification, deforestation and soil erosion. There is similar need to arrest ecological damage to all aspects of India's cultural heritage, especially national monuments. . ."

In order to fulfil its electoral promise, the Congress-I immediately set up a committee for recommending legislative measures and administrative machinery for ensuring environmental protection under the chairmanship of N.D. Tiwari, Deputy Chairman, Planning Commission, Government of India. The committee submitted its report on September 15, 1980 and in its report made far reaching recommendations on administrative and legislative measures for environmental protection. It recommended the creation of a Department of Environment at the centre "to provide explicit recognition to the pivotal role that environmental conservation must play for sustainable national development" with the following functions:

1. to play a 'watchdog' role, to study and bring to the attention of government and Parliament instances, causes and consequences of environmental degradation in all sectors;
2. to serve as a nodal agency for environmental protection and eco-development in a coordinating role;
3. to carry out environmental appraisal of development projects; and
4. to carry out administrative responsibility for—
 - (a) pollution monitoring and regulation;
 - (b) conservation of critical ecosystem designated as biosphere reserve; and
 - (c) conservation of marine ecosystems.

It further recommended the creation of environmental advisors in all ministries, a cabinet sub-committee on environment under the chairmanship of the Prime Minister and a comprehensive and systemic review of the central and state legislations concerned with environmental management.

On the basis of the recommendations of the committee, a separate Department of Environment has been created with effect from November 1, 1980. The functions which hitherto were being performed by the Department of Science and Technology were assigned to the newly created department.

On the recommendation of the Tiwari Committee, the NCEPC has been replaced by a National Committee on Environmental Planning (NCEP) with almost similar functions as that of its predecessor. The NCEP came into being in April 1981 with authority to prepare a 'state of environment' report, to arrange public hearing on conferences on significant environmental issues and to establish a nationwide environmental and information and communication system to propagate awareness through mass media. These duties, in addition to its hitherto management functions, are bound to create confusion on the exact role of the Department of Environment, with the possibility of an agency being relegated to a subservient role. If the role of NCEP is viewed as similar to that of US Council of Environmental Quality, then it will be equally desirable to empower the Department of Environment similar in authority and responsibility as is the case with USEPA.

SECTORAL POLICIES

In this section, we review the policies of the government as included in policy statements and Planning Commission documents in the following sectoral areas:

- (a) Land Resources,
- (b) Water Resources,
- (c) Forestry and Wildlife,
- (d) Industrial Pollution,
- (e) Human Settlements.

As almost all the items mentioned above are included in either the state list or the concurrent list of the seventh schedule of the constitution, the role of the central government in enunciating comprehensive policy guidelines has been hampered. While in our federal structure the central government can lay down the policies to some extent even in areas which are under the legislative competence of the state governments, there has to be a very active participation and political commitment of the state to carry through these policies by launching appropriate programmes. As a result, a federal polity that recognises the above attributed needs to be actively pursued.

Land Resources

An assessment of the degraded land environment can be made by the fact that in 1968, area requiring soil and water conservation was estimated to be 145 million hectares (mh) while in 1980, it was estimated that as much as 175 mh out of our total land area of 304 mh for which the records exist, are subject to environmental problems. The break up is as follows:

Serious Water and Wind Erosion	150 mh
Shifting cultivation	3 mh
Area affected by water logging, salinity and alkalinity	13 mh
Other culturable waste land and Diara Land	9 mh
	<hr/>
	175 mh
	<hr/>

The losses suffered by the country in terms of reduced productivity and resources-base assumes gigantic dimensions and is a major bottleneck in ensuring continued economic growth. According to a study, the top soil lost in the country on account of wind and water erosion comes to above 6000 tons per annum and in terms of major nutrients of NPK above, an annual loss of Rs. 700 crores. In addition soil erosion resulting in flooding, siltation of tanks and reservoirs and loss of water resources also amount to a colossal figure. The most

affected states are Uttar Pradesh, Bihar, Madhya Pradesh, and Rajasthan. In these states, sizable areas are under shrubs and brushes and the main reasons for such lands being unutilised are deep rooted grasses and weeds, lack of drainage, salinity and alkalinity conditions. Large scale degeneration of land into deep gullies has also occurred along the banks of the rivers flowing in north central direction. The problem of rivers has become a major concern because they are penetrating now into cultivated lands.

The degradation of land attracted the attention of the government in the beginning of this century, when in the Pariyale, Land Preservation Act of 1900 was promulgated for the prevention of soil degradation. Since then, several states have enacted laws for soil conservation, but the approach has been generally piecemeal. Research on soil conservation has been continuing in the ICAR since the mid-thirties and appropriate technology has been developed. Increasing attention has been given to soil conservation during the successive plans. But the efforts do not appear to be adequate. Instead of the situation getting ameliorated, it has deteriorated further. It is largely on account of the reasons, that in the states, the soil conservation programmes and officials do not have much clout in the face of major developmental schemes providing visible gains. If the problem of land degradation is to be mitigated, there has to be a clear policy directive from the central government according greater priority to these programmes. The public awareness and educational aspects also need to be highlighted. Before the policy enunciation, a survey of the land with environmental problems should be conducted focusing on the gravity and magnitude of the problem. The state governments will have to be sensitised to this grave issue. A comprehensive land conservation programme identifying the different problematic components and the desired technological inputs in them requires to be mounted on a nation-wide scale.

According National Commission of Agriculture (1975), changes of land-use in India during the last 30 years and the likely changes in the next 40 years are indicated in Table at page 65.

CHANGES OF LAND-USE DURING LAST 30 YEARS AND LIKELY CHANGES
IN THE NEXT 40 YEARS

Year	(million hectares)								
	Reporting Area	Forest	Non-Agrl. uses	Barren and unculturable	Culturable waste	Pasture and grazing lands	Misc. Tree crops and groves	Fallow lands	Net Areas sown
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1950-52	284.3	40.5	15.5	32.0	22.9	6.7	7.9	28.9	119.4
1960-61	298.9	55.8	18.0	32.0	18.6	(51-52)	4.4	22.6	133.2
1966-67	305.4	62.3	16.4	31.9	16.6	13.9	4.7	22.9	136.3
1977-78	304.9	67.1	17.6	21.4	16.0	14.3	4.0	22.8	142.6
2000*	318.0	70.0	26.0	30.0	9.0	12.0	5.0	13.0	150.0
2025*	318.0	70.0	36.0	24.0	4.0	15.0	6.0	8.0	155.0

*Projected.

If the projected land-use has to be realised, especially in the face of deteriorating situation, massive efforts will be required. However, in many states, it has been experienced that soil conservation works have been executed without prior soil surveys (including hydrological and erodibility groupings) and considerations of land capability. In some states, infrastructure and facilities in respect of equipment and trained personnel are lacking, while in others, no worthwhile organisation exists to carry out this work. It is necessary to consider these, while mounting massive land reclamation programmes.

Water Resources

The rational use of land and water resources is so inextricably linked that an integrated approach is necessary for the management of the two major resources. Whilst a good deal of attention has been paid to harness the water resources by way of construction of major, medium and minor irrigation projects and the development of the ground water resources, the non-incorporation of accompanying environmental safeguards and soil conservation in the water-shed area has resulted in a variety of problems. The recurrent floods which, on an average, account for the loss of approximately Rs. 1000 crores every year, is a consequence of growing deforestation and soil erosion, the raising up of the river beds and flood plains within embank and inadequate and improper drainage. The attention of the government so far had been on the construction of bunds and dams. Though these provide some immediate and direct benefit in alleviating the suffering, they do not touch the root of the problem and provide assured and lasting benefit. The basic thrust should, therefore, be on the prevention of deforestation and unscientific exploitation of the forests and grasslands and to promote a massive programme of afforestation and restoration of vegetative cover. The construction of structures which encroach on the flood plains also need to be checked to improve the situation. Normally flood damage is sought to be minimised by impounding flood water at selected sites to secure multipurpose benefit. It is necessary to give due thought to ecological consideration besides the engineering consideration in the designing and implementation of such storage dams. Due to

soil erosion and consequent siltation of water bodies, the longevity of the big multipurpose projects is under severe stress. The damage done by the denudation of the Himalayan and other watersheds to our water resources also needs to be properly appreciated. Since the run-off of rain water from denuded areas is far greater than from well-wooded slopes, a great deal of water which otherwise would have been retained as sub soil and ground water is today lost to surface run-offs often causing further erosion and floods.

The government has recognised the need for comprehensive land and water resource management. Accordingly, the development of water resources is planned on the basis of river basin approach. Command Area Development Schemes which include systematic programmes of land consolidation, scientific land shaping, construction of water courses and field channels, drainage works along with infrastructural and marketing facilities to derive optimum benefit from land and water resources, have been launched. The approach, at present, has been on the development of inter-state, bilateral programmes, but for optimum and proper utilisation of water resources, there is a need to bring in an integrated and multi-disciplinary approach in consultation with all the parties concerned.

As fresh water is a scarce commodity, its efficient management will become more imperative in the coming years. It would, therefore, be necessary to make a survey of hydrological, erodibility and other relevant parameters of all the major water-bodies and designate them as the basis of Best Use Criteria. Development of water resources should be planned and implemented only after deciding rationally the most advantageous use it could be put to. Such schemes should also incorporate adequate safeguards for the protection of environmental quality. The Tiwari Committee has also recommended that executive and legislative measures are woefully lacking in the protection of catchment areas and protection of wetlands and estuaries. Necessary infrastructure needs to be created for this purpose.

There is another problem associated with proper water management. The user authorities of water resources are so numerous and diverse and at times overlapping in functions

that a substantial coordination mechanism is required to bring an element of optimum management. The need to establish one authority for beneficial use of water also needs to be explored.

The marine ecosystem and resources have not been adequately studied and conservation efforts are altogether lacking. The living resources have been sub-optimally explored. The coral formations and coastal mangroves are in a state of continuous degradation. There is no agency, even despite the creation of Department of Ocean Development, to take a comprehensive look on the enormity of the problem. Tiwari Committee has also recommended an "urgent need for entrusting the responsibility for conserving the country's vast and rich marine ecosystems to a single Central Agency". There is also a need to establish and manage some marine national parks in critical areas.

Forestry and Wildlife

India has been endowed with an immense variety of forestry resources and wildlife. However, with the continuing pressures of an exploding population, and the growing needs of industries, our forestry resources are fast dwindling, and several species of wildlife have become extinct. The continuing degradation of forests has created environmental hazards in the form of floods, soil erosion, desertification, silt damage, droughts, and weather disruptions. It is estimated that since 1952, about 4.2 million hectares of forest land have been lost, and the remaining part is in a degraded condition. At the same time pressure for fuel, fodder, building materials, and pulp has been constantly increasing.

The present forestry policy is based on the 1952 National Forestry Policy and the legal provisions derive their strength from the Indian Forest Act 1927. In addition, each state has its own forest laws. Both the forestry policy and the forest laws are in dire need of updating and revisions. Towards this end, the National Commission on Agriculture recommended in 1976 to unify all the forest acts for the country. The consequent constitutional amendment placing the subject of forests and wildlife in the concurrent list of the seventh schedule of the constitution has achieved the desired unification.

But a desired change in forestry legislation should be based on the concept of forest conservation and protection rather than the existing system of resource exploitation. The large scale of deforestation in recent years has made the catchment areas in the Himalayan and other hilly regions most vulnerable to soil erosion. The 1952 National Forestry Policy suggested a target of 33 per cent forest cover of our surface land; however, not more than 12 per cent of the country's land surface is actually under adequate tree cover. Another example of the scale of deforestation is that while 75 million hectares are supposed to be forest lands presently less than half is actually under adequate tree cover. Agricultural productivity will suffer tremendously in future if water logging, salinisation, and floods continue to take place in a regular manner. Meanwhile, recommendations have been made by such agencies as the Central Board of Forestry, and the N.D. Tiwari Committee to make immediate changes in the national forestry policy and in the various forestry laws. Some of the significant suggestions are: (a) the revised policy should put greater emphasis on the conservation and protective role of forests; (b) no further diversion of the forest land to non-forestry uses without a prior approval of a Central Authority established for this purpose; (c) forest encroachers must be tried and punished soon; (d) nationalize the forestry trade so as to eliminate illegal felling of trees by forest contractors; (e) severe punishment for various forest offences; and (f) afforestation programme should be pursued vigorously, including proper encouragement for social and farm forestry. However, any new or revised forest policy must be backed by adequate authority delegated to the state forest officers, speedy assistance where needed to be provided by district law enforcement departments, and sufficient funds to provide necessary monitoring, surveillance, and enforcement services. The Forest (Preservation) Act, 1980 has been promulgated to regulate the use of forest land for non forestry purposes.

In the case of wildlife, the situation is more serious. There is hardly a place which may be considered virgin and untouched by man's activities in India. As a result, most of the wildlife habitat has shrunk so much that with the exception of a few reserved areas, wildlife are becoming extinct or

greatly endangered. In order to provide proper habitat and protection of wildlife, it is desirable to revise the 1972 wildlife (Protection) Act. More sanctuaries and national parks should be established for the purpose of protecting, propagating or developing wildlife and its habitat. There is a need to have an uniform wildlife policy in all the states, supplemented by the Centre's legislation and administrative support.

Environmental Pollution

Although there are various kinds of pollution, like water, land, noise, radiation and odour; only water and to some extent air has received governmental attention.

Water pollution: In India, the major source of pollution of our natural waters, including coastal waters, is the discharge of community wastes from cities, towns and industries. While the contribution of domestic waste amounts to 84 per cent to 97 per cent, the industries account for only 3 to 16 per cent of the water pollution. Most of the cities and towns in India do not have sewerage facilities and where they do exist, facilities for the treatment of waste are seldom available. Thus most of the community and industrial waste water finds its way into water-courses without treatment, rendering the water downstream unfit for use. This has been exacerbated by agriculture run-offs, which contain pesticides and other hazardous chemicals, the use of which is continuously increasing. Most of the irrigation waters, in the absence of other sources, become handy for the discharge of municipal wastes. It is estimated that water used for irrigation consists of 50 per cent sewage.

According to a survey conducted by the Centre of Environmental Studies, Jadavpur University, only eight cities in India are provided with complete sewerage and sewage treatment facilities. Out of 142 Class I cities surveyed, only 43 per cent population of these cities had sewerage facilities and only 37 per cent of the waste water receives some form of treatment. According to another report, only 198 towns covering 27 per cent of the total urban population have sewerage facilities, that too to a limited extent. The conditions in class II and class III cities and in rural areas are obviously much worse. At the national level, a little over 5 per cent popula-

tion is covered by sewerage facilities and only 3 per cent have access to sewage treatment systems.

The position in regard to potable water is also highly unsatisfactory. It had been estimated in 1971 that the percentage of population that has access to piped water supply was less than 10 per cent. In 1978, about 95,000 villages in the rural areas and 17 per cent of the urban population in 1029 towns out of 3121 towns in the country, did not have protected water supply. The water supply schemes, even where they exist, require improvement and expansion.

Since the inception of the economic development plans in 1952, investments made by the Government of India on water supply and sanitation are as follows:

EXPENDITURE ON WATER SUPPLY AND SANITATION

(in \$ million)

	<i>I Plan</i>	<i>II Plan</i>	<i>III Plan and three annual plans</i>	<i>IV Plan</i>	<i>V Plan</i>
1. Rural water supply	8.2	82.1	60.0	260	435
2. Urban water supply and sanitation	21.9	120.5	217.5	425	521
TOTAL	30.1	202.6	277.5	685	956

The Sixth Five Year Plan envisages the provision of drinking water facilities to all the villages which do not have potable drinking water. In addition 1050 urban water supply schemes and 170 urban sewerage and drainage schemes including augmentation schemes are contemplated.

A number of legislations exist for prevention and control of water pollution since the mid nineteenth century, the most important is the Water Prevention and Control of pollution Act of 1974. The Act is applicable to 17 of the 22 states and to all the union territories. The Central Board has been constituted for undertaking regulatory measures for the

prevention and control of water pollution. The Act is intended to control water pollution from point sources only and, thus, has limited applicability. The non-point sources such as acid rain, agricultural run-offs, etc., are not covered under the Act. The Act also does not provide for public participation and suffers from several deficiencies, which are utilised by the industrialists. The approach of the government in bringing the major industrialists under the punitive provisions is also ambivalent. The municipal authorities, enjoying the protection of the state governments, and due to lack of financial resources, have generally not implemented the provision of the Act. As a consequence, they have not been able to effectively check the water pollution.

Air pollution : Air pollution has become an area of major concern in the urban centres. The main contributors of air pollution in the urban pockets are thermal power generation plants, iron and steel mills, petrochemical and fertiliser complexes, synthetic fibre factories, metallurgical works and chemical, ceramic and pharmaceutical industries. According to a study, steel mills and petrochemical complexes are the two biggest sources of air pollution in India. Use of low grade and inefficient fuel in the domestic and industrial establishments also contribute to air pollution hazards. Air pollution due to automobiles is not on account of traffic density, but as a result of their poor performance and maintenance. Studies of two major cities show that auto-exhaust alone contributes 70 per cent of carbon monoxide, 50 per cent of hydrocarbons, 35 per cent of the particulate matters and oxides of nitrogen in the atmosphere.

Calcutta, with lower wind speeds and conditions of frequent temperature-inversion, is one of the most polluted cities of the world: its carbon monoxide concentrations at peak periods are comparable to the levels in New York, Los Angeles and Washington. Thermal power stations located all over the country are also a major source of air pollution. The location of Indraprastha Power Station in the heart of New Delhi is known to be a significant source of pollution in Delhi. Its proposal of extension by constructing two other power generation installations was not considered safe and

acceptable by the Expert Group of the National Committee on Environmental Planning and Coordination, which was constituted to study the environmental aspects of the extension of the plant.

Injudicious siting of industries has also aggravated the problem. Bombay, a major industrial centre, had to be closed to further industrial development on account of health hazards. Location of a major petrochemical complex in the state of Maharashtra has also raised an issue of grave public concern as to whether the location of industries should be based on political considerations or the recommendations of the expert committee. Despite the committee's recommendation to locate the complex at Tarapore, the government was guided by political considerations and chose to locate it at Thal-Vaisett—a site regarded as hazardous by the expert committee. The major controversy over the location of a petrochemical complex at Mathura, endangering Taj Mahal and the bird sanctuary at Bharatpur, is also an indication of public concern about the hazards of air pollution. The expert committee set up by the Government of India and its Italian consultants expressed the view that high air pollution levels at Agra are on account of foundries, railway marshalling yards for coal locomotives and two thermal power plants—all located in Agra and that the contribution of sulphur dioxide levels from the refinery is only 1 to 2 ppm, which is not considered very significant. However, some experts harbour the view that Taj Mahal is threatened by the refinery complex.

Smoke nuisance poses a great threat in major industrial cities of Kanpur, Bombay and Calcutta. Burning of low grade fuel leads to the accumulation of coal ash which could be a major health hazard and be responsible for poor visibility.

The excess corrosion of railway electric transmission systems in Kalyan near Bombay is attributable to sulphuric acid and other chemical factories located in the vicinity.

There are several enactments, albeit obsolete, for the prevention and control of air pollution. The Air (Prevention and Control of Pollution) Act, enacted in May 1981 is a comprehensive legislation for the control of air pollution. The water

boards established under the Water Act, 1974 will perform the functions under the Air Act also. Twelve kinds of industries have been identified for regulation under the Act. It is proposed to first concentrate in areas having severe air pollution and then spread to other areas. Experts have indicated some shortcomings in the Act. But the rules under the Act are yet to be notified and opportunity has not been so far available to test the efficacy of the Act.

Toxic chemicals: Industrialisation has also brought an increase of toxic levels in its wake. Heavy metal pollution like lead, mercury, cadmium, arsenic, etc., is also the outcome of greater industrialisation. One indicator of the malaise is a rise beyond tolerance levels of the lead and mercury levels in the fish of the coastal water around Bombay. DDT and chlorinated hydrocarbons, which have been banned in many developed countries on account of their health effects, continue to be widely used in India.

Nuclear energy is yet another hazardous substance. There exist a number of atomic power plants for generating electricity. Occupational exposure, in addition to radio active contamination of the coolant water and storage of spent fuel, may be a likely source of radiation pollution. A number of projects in the sector of nuclear energy like the development of a prototype fast breeder thermal reactor (FBTR) which will use plutonium as fuel and convert thorium into fissile material, the development of 500 MW generator and installation of medium energy heavy ion accelerator, etc., call for greater safety measures for preventing pollution hazards.

The Tiwari Committee, while reviewing the Insecticides Act, 1968 for the control of pesticides has made the following observation:

This act which regulates all aspects of the use of pesticides has not encouraged strongly enough the move away from the use of organochlorine pesticides which are in disfavour all over the world for their proven detrimental effects on the various living natural resources of the environment. The use of biological or integrated pest control in India has hardly caught on in any significant measure. The implementation of the provisions of this Act for monitoring pesti-

cide residues in the environment is totally inadequate. It is hence not surprising that increasing levels of pesticide residues are being recorded in foodstuffs, animal tissues and even human fat. Meanwhile resistance of pests like the malarial mosquito to chemical pesticides is on the rise.

The Atomic Energy Act 1962 along with the rules framed thereunder controls the radioactive pollution. There has been no official study on the subject so far, but the nuclear establishments are mainly managed by government agencies and generally the information on radio-active levels is lacking or not made public.

While a number of internationally accepted principles have been laid down and adopted in nuclear power operations, the enforcement of these principles rests with the production establishments in the absence of any independent monitoring agency. There is a need to establish an independent regulatory authority outside the purview of the Department of Atomic Energy. In view of a number of programmes launched by India in the field of nuclear technology, greater caution is needed for surveillance and monitoring.

Noise pollution: Noise in our cities has assumed grave dimensions. Studies by the National Physical Laboratory, The All India Institute of Medical Sciences, The National Institute of Occupational Health and the Madras Medical College have indicated the growing threat to our physiological and mental well-being from community noise, traffic noise and noise in the occupational environment. Legislations on noise pollution are almost non-existent. Only some bits of legislation for regulation of loud-speakers, playing of radios and traffic noise exist, the implementation of which is very poor.

Human settlements: In India, there are over 5,79,000 human settlements of which nearly 3,000 are urban. In the rural areas, the environmental problem is mostly on account of insanitary living conditions and due to over-use or mis-use of natural resources mostly because of sheer poverty and lack of alternatives. The deforestation, lack of fuelwood and overgrazing by cattle and other livestock population have resulted in the depletion of natural resources necessary for sustenance. The absence of toilet facilities have resulted in

contamination of rivers and waterbodies and as a result, adverse effect on health has been witnessed. Water-borne diseases have become rampant. Due to poor infrastructural facilities and opportunities for employment, large scale migration to the urban areas has taken place contributing to the urban blight.

In the urban areas, also, situation continues to be unsatisfactory. The large scale migration and natural growth in the urban pockets have resulted in phenomenal increase in the urban population. The pressure on land and water resources has also mounted so much that they have become very scarce commodity. Only a fraction of the population has access to sewage treatment and sewage facilities. The master plan or land-use plan of the urban areas is under severe stress and there has been steady deterioration in the urban services and environmental facilities. Only 8 cities in the country have 100 per cent sewage facilities. The urban growth has encroached upon fertile agriculture lands thereby reducing agricultural productivity. The trends will be intensified in the future and drastic measures are called for ameliorating the situation.

So far attempts at environmental improvement in human settlements have been made in a disjointed and piecemeal manner with attention focused on one particular function or the other (such as road, transportation, water supply, power generation, etc.) rather than treating settlement and their activities as a dynamic whole. Vigorous and well thoughtout coordinated steps are now required for environmentally sound planning and development of human settlements.

Several attempts to deal with the problem in the past, though well meaning have either been ill-conceived or executed in a half-hearted way and their impact on the urbanisation problem has been negligible as can be seen from the progress in deterioration of the environment of places like Bombay and Calcutta. Laws aimed at preventing the growth of large cities and especially the congested areas have been watered down under the pressure of the greed of the land speculators. The time has come to take some bold policy decisions which brook no delay and which have tooth so that they can become effective. Such a policy will be a mix of incentives and disin-

centives. Some measures could be:

- (a) Preventing the growth of industries and large establishments in cities over a certain maximum size.
- (b) Enhancement of the rates charged for all infrastructural inputs and services in large cities and the resources so collected to be used for subsidising these inputs into small and medium towns. Subsidies and tax incentives can be provided for offices, factories etc., which move to smaller cities or move from congested areas to permissible areas.
- (c) Creation of inviolable green belts/green areas in and around all cities.
- (d) Sharp reduction of floor space indices to prevent the construction of high rise buildings in large cities.
- (e) Investment in creating of infrastructure facilities and amenities in small and medium towns and making them available to all private and public parties at concessional rates, *e.g.*, soft loans for housing, subsidies for schools, hospitals, colleges, cinemas, transport, telephone connections on demand, subsidised power and water tariffs, etc.
- (f) Improvement and regular clearing of slums and shanty towns.
- (g) Formulation and implementation of well planned urban development programmes taking note of the need for parks, minimising commuting distances, proper sewage and transport systems, etc.
- (h) Banning of private cars from congested streets and augmenting public transportation systems.
- (i) Government offices (both state and central), banks, financial institutions, public sector corporations to give the lead in heading this decongestion movement.

CONCLUDING OBSERVATIONS

We conclude our paper by highlighting specific issues which we believe should receive active consideration by the policy makers and other interested groups.

National Environmental Doctrine

It is evident to us that today the country suffers from the absence of a coherent national environmental doctrine which can provide a realistic account of the impact of growing urban population (due to an accelerated flight from the land) coupled with the new reaches and values of industrialization on the already over-taxed environment of the country. Certain questions may be raised: What is India's environmental doctrine? Who, if any one, speaks for it; and how is it manifested in governmental policies, programmes, as well as in educational efforts? The absence of nationally formulated, having an overview of the country's needs, aspirations of its populations, perceived requirements of the future generations, and the goal of living in the community of nations with dignity has created an intellectual and managerial gap which cannot be filled that easily by transplanting borrowed concepts from abroad. The doctrine will have to be based on the cherished values that Indian Society has continued to profess over the centuries. One will have to go back to Vedas, Upanishads, edicts from Emperor Ashoka, and similar sources to trace and retrieve the essence of environmental protection as enunciated by our sages. Our ancient scriptures have stressed that man and nature need to live in close harmony, and plants and animals should be the objects of unlimited kindness and benevolence since they make no demand for their sustenance. We have been warned through *Charak Samhita* that when air, water and other elements of nature are polluted, seasons start working against their routine or cycles; vegetations gradually begin to ruin; this is most dangerous for the nation and human beings. Thus, one can re-strengthen the nation's resolve to protect and conserve the environment by drawing upon the writings and admonitions of ancient sayings. We are, even for a moment, not saying that one should reverse the process of modernization to preserve the environment; what we are emphasizing is that in order to build a national environmental conscience, we should not be ashamed of reviving certain values and beliefs which have proved to be timeless, and which in comparison to any other religious or doctrinaire philosophy, are still worthwhile. Of course, we shall be careful in taking only those elements which are

relevant to our present needs and aspirations. Protection of the environment presents fundamental challenge to the nation's desire to industrialize faster, to be self-sufficient in food, and to be able to fulfil certain basic needs/wants of the society. This challenge need not work against the above mentioned national aspiration. At the same time, we must develop the ability to conceive alternative strategies and policy options. At present, environmental policy is being produced partly by a national committee, partly by the officers of the Department of Environment, and partly by the noises made by media and educationed elites; whereas the business community is yet to take this challenge seriously. However, these efforts can be greatly assisted if we have a national environmental doctrine. Because environmental quality, to be meaningful or lasting, must ultimately reflect not only our desire to industrialize faster but more so an acceptance by the society that it is a fundamental necessity in life, that vision will largely emerge upon due environmental education aided by environmental awareness. Thus, a national environmental doctrine should be formulated which draws upon the best traditions and values of our culture; a doctrine which helps us to have an appropriate level of industrialization without the total destruction of our precious environment: a doctrine which regulates and accommodates the present and staggering problem of flight of population from the countryside to urban areas; and a doctrine which finally assures us the fulfilment of the basic needs of the populace. For this, there is an urgent need to build our own intellectual and scientific base—a need for intellectual self reliance: at the same time, we should not hesitate to borrow, graft, transplant and improvise upon the skills and technology from abroad to suit our special condition.

Environmental Awareness and Education

Unfortunately, the threat that pollution poses to the health and welfare of the public is yet to be seriously taken even by our enlightened citizens. The national indifference to environmental damage, the wrongly-placed notion that environmental protection will reverse the process of industrialization, the callousness with which industries and municipalities continue

to pollute the environment, and the amazing (but totally stupefying) ability of the public to tolerate the destruction of their precious air, water and land resources are some instances of the problems that we face in India. In order to encourage members of the public to question and criticize those who continue to pollute the environment, there is an urgent need to inculcate in them the value of environmental quality, and the benefits (both affecting health and wealth) that they can reap from the enjoyment of a clean environment. Members of the public by themselves, will seldom venture into this battle to save the environment if their total attention is always placed on the battle of survival. In this respect the leadership will have to come from: (a) educational institutions, (b) mass media; and (c) judiciary. It is upto the educational authorities to launch a national environmental awareness and education programme, akin to Chipko movement, and to begin the environmental education at least at the junior high school level. Mass media will have to be more vigilant; and it is morally obligatory to publish expose of pollution cases. Finally, it is the judiciary which must safeguard the concept of social justice, because in the final analysis it is the poorer section of the population which suffers most from the pollution.

In 1975, writing in the *International Review of Administrative Sciences*, one of us said the following which is still relevant in the year 1982. Although the nation has one of the best groups of scientists and educationists, efforts to do research on 'pollution' have been scanty. The universities and government laboratories have not paid due attention to master a pollution control technology which would be highly suitable to India's socio-economic and cultural background. Importing technology from the industrialized countries may not only be very costly but may also be less useful from India's viewpoint. Consequently, self-reliance should be the watch-word for scientists. At the same time, the current state of dismal absence of environmental education, specially in humanities and social sciences in India's universities and colleges, needs immediate and radical reform. Increased funds for research on how to control pollution, and for development of environmental studies programmes in educational

institutions must be given priority by both the central and state governments. Earlier we mentioned intellectual self reliance. It is the environmental area which urgently requires concerted effort, but more so in the form of multi-disciplinary research and training, by our post-secondary and research centres to undertake necessary studies and research. The time has come for these institutions, and environmentally conscious educationists to get on with the serious work from the stage of discussion. Towards this end, certain centres of excellence on various aspects of environmental studies will have to be established; a national environmental society/congress should be formed which meets on a regular basis where participants representing educationists (both scientists and arts professors), officers of the centre and state environment and science/technology department, media, and judiciary are encouraged to share their views. Precaution should be taken not to make such a society/congress an exclusive preserve of a section of educationists or of only educationists.

Environmental Accountability

Administrative accountability is one of the most important challenges being faced by a modern government anywhere. The major question is how to be accountable to those who are being governed; and yet in the final analysis it is they who decide the nature and the process of governance. While we shall not indulge in the discussion of the finer points of governing a polity, the question of accountability cannot be avoided in a democratic system of government as we have in India where popular demands and choices are interpreted by elected representatives. In this system, the system of accountability is an activating but a fragile element permeating a complex network connecting the cabinet upward to parliament and downward to departmental bureaucracy. In this process, cabinet acts as a control room and accountability moves like the current. So in the final analysis it is the leadership of the cabinet which is called to account for action or inaction of a programme. The cabinet in turn must hold the administrative machinery fully accountable for the manner in which the given assignments and responsibilities have been discharged. In the case of environmental protection, decisions are seldom

homogeneous. Some of the decisions are motivated purely from political expediency, some are influenced by the powerful commercial and business concerns, while others are highly technical and beyond the comprehension of ordinary public. And some decisions affect the whole nation, while others are local in nature. Thus, the decision-making is multi-dimensional. Moreover, it includes a multitude of potential and real decision-makers. Sometimes, a departmental or agency/board's head is responsible for the decision, while in other cases it is the minister or the cabinet; and yet in other cases courts intervene. So, when we ask these questions who should be accountable, to whom, for what and how, we should know the linkages between these questions.

Accountable for what, from environmental management viewpoint, means being accountable to achieve the stated constitutional objectives. For example, article 48A of Indian Constitution says: "The State shall endeavour to protect and improve the environment and to safeguard the forests and wildlife of the country." Of course, it is a very wide statement, but at least it is enshrined in the constitution, an example one may not find in a western country. The key words in this article are 'protect' and 'improve'—in the sense that it is the duty of the central and state governments to preserve the environment from further degradation, and also to improve its quality for future use. Similarly, article 49 obligates the nation to protect cultural and historical property.

This overall obligation, then is re-inforced by section 51A of the constitution which obligates every citizen with the duty "to value and preserve the rich heritage of country's culture, and to protect and improve the natural environment including forests, lakes, rivers, and wild life. . . ." Thus both articles 48A, and 51A are complementary to each other in the sense that while the former obligates the state the latter encourages every citizen to do his/her environmental duty.

To expect a citizen to be environmentally conscious, and fulfil his constitutional duty will be too much to ask unless there is suitable leadership from the elected and appointed public officers. Thus, the main obligation of the state is to first fulfil its constitutional requirement, set an example by appropriate laws, rules/regulations, enforcement and review

mechanism, and invite the public to participate in the environmental policy process.

The second question—accountable to whom—means, the horizontal and vertical accountability of the governing machinery. It means, while in final analysis, all the three branches of government are responsible to the public, to protect its interest, the main linkage is a horizontal one between the legislature, the executive, (including its bureaucracy) and the judiciary. While we can leave the judiciary out of our purview now, the main issue is, whether the parliament and state legislatures are capable enough to hold the cabinet accountable. It seems that the present complex nature of party-politics, and political process has left the legislatures and parliament at the most weakest stage of their existence in India. That is why there is a growing tendency in India as well as in other democratic societies to use the judicial system to force both the administrative apparatus as well as the industrial sector to hold the line. The Ratlam Pollution case is a good example where the Supreme Court of India upheld the concerns of citizens who complained of unhygienic and unsanitary conditions due to municipal and industrial wastes.

An appropriate environmental accountability would require the officers of the centre and state environment departments, but more so of respective boards of air and water pollution to take their duties seriously, and act responsibly, so that the public perception about the laxity in enforcement of rules and regulations meant for preventing further damage to the environment is removed. Of course, administrative commitment to protect the environment would not be enough by itself unless it is aided and abetted by the quality enlightened and environmentally dedicated political executive. Both will have to show a great amount of restraint in facing the temptations while enforcing environmental laws.

We would like to conclude our review, supplemented by the above mentioned three general observations, by reiterating the *raison d'être* of environmental policies in India: development with conservation. Within this basic philosophy, all efforts will have to be made to minimize any negative effects that the process of development brings on the society. Environ-

mental protection and conservation will have to be the backbone of our national development.

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REMARKS OF THE PRINCIPAL DISCUSSANT

S.K. CHOPRA

I would like to start with the title of the paper: "India's environmental Policies". First of all, we certainly need to understand what is this term environment. It is being dealt by different departments at different levels, in different ministries, at different places and people have a tendency to treat this term to suit their needs in isolation and they do not try to understand this term in its totality. 'Environment' is a very vague term. It includes everything on this earth, everything that influences man, every kind of life. It is, therefore, necessary to have a comprehensive policy which can really protect the environment.

In India we did try to have environmental policy on our statute books by putting this environmental protection in the constitution after the 42nd amendment in 1977. This has been placed in the directive principles of state policy, which is the weakest part of the constitution, the weakest part of the law. It is a law which, when put into a law book, cannot be enforced in the country.

Now, what is the use of such a law. When the constitution was being drafted the Constituent Assembly, to fulfil the wishes of the people who were sitting there expressing different views and whose views could not be accommodated into the laws of the country, prepared the directive principles of state policy and in 1977, after so many years, such an important issue goes into that part of the constitution which cannot be implemented. Though the Prime Minister has a great desire to see that the country has a good environmental policy, there is, however, no strong law which can be implemented.

This was followed by a few acts like the Air Pollution Act

and the Water Pollution Act, which were enacted long before a comprehensive environmental policy was prepared. In fact, it still needs to be prepared and spelled out. With the result, we have the Air Pollution Act which, in section 22 perhaps, says that the air pollution act will be applicable only to the area declared as air pollution control zone and will be administered by the air pollution boards. This means that once we have polluted an area, only then will we go for the protection of that area, only then will we go for the conservation of that area. This means, we must first pollute, we must first degrade the environment, and then only protect it. This kind of policy, this kind of legislation, has come up. Why?

It's a big question mark and I can't understand it. So far the arguments given are: we do not have the machinery; we do not at present have the administrative structure suitable to look after the needs of the whole country.

Further, environment cannot be left with the states, state units or with one country, to be managed. The environmental protection, or its policies, come from the international level, being made there first. We have made a commitment to them and we must fulfil it. It's not the question of whether water should be left with state so and so, and land should be left to another state. The management part of it is fine. But as far as the environmental aspects of the thing go, it must be within the purview of the central government.

The Tiwari Committee, which brought the department of environment into existence, mentioned that environmental protection should be brought into the concurrent list. Even so, what kind of laws are there. Some states are trying to come up with their own legislation like noise pollution. I am aware that some states are trying to build up their own rules and regulations. They will make different regulations and we will have different standards. We have the air and water pollution act, but no uniform standards. Do the people in this country have different living standards and different requirements from the environment to survive. I guess every human being is the same and every human being needs the same kind of standards for living.

For the management of environment, what is required? We need a set mechanism through which we can administer, an

infrastructure and certain laws. We have created that kind of infrastructure for water pollution, for air pollution, it is still coming up, but what about the other areas. There is no infrastructure. Nice statements are given. Good desires are expressed, but no infrastructure has come up. It was in the Fourth Five Year Plan, disappeared thereafter, re-appeared in the Sixth Five Year Plan and still we have to see what kind of a mechanism for a comprehensive treatment of the environment comes up, where we can say we are dealing with the environment in totality. □

ABSTRACT OF DISCUSSION

It was suggested that wherever the law provided, and a socio-political will existed, efforts should be made to bring in central legislation to cover crucial areas of the environment, very similar to the shorts of legislation brought in to implement land reforms.

It was also suggested that conditions conducive to the preservation of the environment should be built-in to various procedures like the lease and licences given for industry and mining. It was suggested that a mining lease should include as a condition the requirement that mines would be filled in after the minerals were extracted.

However, notwithstanding the current crises, many people suggested that there should be no undue gloom over the present state of affairs and quoted the Prime Minister who has said that we have to fight against poverty and naturally in the process we have to tinker with nature. To what extent we tinker with nature and where exactly we should do this has to be carefully worked out.

4. There was a very strong plea, especially from representatives of public sector industries, for a review of the existing environmental laws and policies in terms of the problems of implementation. Specific cases were cited where despite the best efforts of the industry, unnecessary problems were created in giving it clearance for the discharge of its effluents and for other such environmentally related problems.

It was also pointed out that the ISI specifications regarding the effluents were both out-dated and had been unthinkingly adopted from developed countries. These, it was pointed out, also needed to be revised and made realistic.

Some of the participants pointed out that it was not true to state that laws in most of the states were inadequate to handle problems of the environment. Madhya Pradesh, for example, some participants stated had very stringent mining laws which ensure a proper protection of the environ-

ment. Similarly, Maharashtra was stated to be a pioneer in the area of legislation for human habitation: legislation which comprehensively covers environmental protection.

There was a very long and detailed debate regarding the proposed Indian Forest Act. Whereas many participants felt that this Act was not only anti-social and unethical, especially in relationship to the poor and the tribal population subsisting partly or wholly on the forests, they also felt that the Act did not really tackle the main problem which is the exploitation of forests by commercial interests. Some other participants felt that there was nothing new and consequently objectionable in the proposed Forest Act and that the essential provisions in this Act were already there in the Act of 1927. They argued that newspapers and the media had unnecessarily vilified this Act and that those among the participants who were opposing it should wait for the official draft to be circulated.

However, one of the participants replied: "Taking up what some participants have said about this forest bill being only a draft, some members of the Kalpavriksh, some time back, when we started trying to find out more about this bill, found that only very select copies were in circulation. The Central Board of Forestry, meeting in 1980, finalised the draft of this new act, which is now under consideration of the government.

"The manner in which the government has been reacting, as a whole, to the forest bill is like when a cat jumps at a pigeon, the pigeon closes its eyes and says that the cat is not there. The cat is there and it is going to catch the pigeon, closing eyes won't do away with it.

"This bill is in a real sense a very important development in the evolution of forest policy in India. Way back in 1864, the rights of the tribals were designated as the rights of community and, in 1894, the British enacted a forest act which made it the rights and privileges. In 1927 this was affirmed as rights and privileges of persons. In 1952 it became rights, privileges and concession (National Forest Policy) and today what were originally rights of community are being recognized as crimes.

"It is true it may be a draft, but as far as we know, and you

are administrators and will be knowing, government departments don't prepare drafts just for fun. They prepare them with a very particular purpose. The purpose being that the draft is to be enacted. Which is precisely why it is being circulated in certain select circles.

"One of the very interesting clauses specifies 36 products including leaves, flowers and fruits as forest produce and by gazette notification now, the central government and I think the state government can say that so and so tree cannot be cut. Now, any of us who had read a government gazette, knows that it is utterly incomprehensible. Maybe experienced lawyers can understand it but even a person who has gone to college and not studied law cannot understand it and tribals, the majority of whom are illiterate, are expected to know from the gazette which particular tree cannot be cut?

"By saying this is only a draft, we cannot escape it. This is a policy of the government. It is being enacted. There are provisions like the one which states that after sunset or before sunrise the punishment which is given can be doubled, *i.e.*, normally if you are going to be sentenced to 3 months you will be sentenced to 6 months. If a tribal goes into a forest area after sunset he can be arrested and sentenced upto 3 years imprisonment, that is the maximum, and be fined Rs. 5,000. What is this Act. It is a direct attack not only on the civil liberties of the people, it is an attack not only on their right to livelihood which is defined in the constitution: article 39A, but it is an attack on our environment and on our forests. Instead of stopping the destruction of the forests it is going to speed it. It is not going to let a tribal go into a forest and pick up a flower which he has been doing for centuries but it is going to allow contractors and forest officials to sell the forests for commercial purposes."

The close relation between forest and the environment was pointed out by various participants. It was felt that unless proper steps were taken to preserve our forests, very little could be done to preserve the rest of our environment. However, it was also pointed out that the administrative structure designed to look after these problems was inadequate and this was obvious from the fact that the forests were not the responsibility of the Department of Environment and that

very few forest officers, if any, were associated with the Department of Environment.

It was acknowledged that environmental problems of rural areas often differed from those of the urban areas, for instance the problems of water pollution and air pollution were primarily urban problems while the problem of degradation of land was primarily a rural problem. Perhaps, some participants argued, we must clearly understand this in order to work out a proper strategy for environmental management.

Some people suggested that we should form a policy by which every tree cut must be replaced by three trees. This would ensure that our forest area would increase threefold.

11. A serious problem regarding fodder was also discussed. Considering the large number of cattle in our country, it was felt that unless some very urgent and scientific steps were taken the problem of feeding our cattle stock would become too large to handle within the constraints of rational environmental management. It was suggested that trees should be planted on government land and on road sides while lands in our villages should be converted as far as possible for planting fodder.

Commenting on the 42nd Amendment of the constitution and article 48A and responding to the feeling that environment should be a state subject, it was argued that not only should environment not be a state subject but in some senses you cannot restrict environmental legislation to one specific country. In support of this it was mentioned that polluted air, for example, could travel freely from one state to another and likewise polluted water even from one country to another. The water of the Ganges, if polluted before it enters Bangladesh, would have disastrous effects on fisheries in Bangladesh, or on the health of the people there. Environment, as such, must be seen as an international issue and not as a state or a national issue.

Examples, of developed countries were cited and it was pointed out that in countries like Canada the people have to suffer from acid rains because of the effluents thrown out by industries in the USA.

There was some resistance to the idea of legislation for it was argued that India has more than 3,800 central legisla-

tions, most of which are not being implemented. The participants saw little point in adding to this list and it was felt that a more effective way to handle the problem would be to create a socio-economic environment within which problems of ecology could be adequately looked after.

The question of economic development vs. environment management was raised again and again. Some participants felt that the environmental bogey as it was being raised these days significantly inhibited economic development. They felt that India as a developing country could not afford to spend so much effort and money on environmental conservation and could not afford to retard its industrial growth in order to preserve environment. The participants representing the industry specially stressed this point and tried to underscore the sorts of problems that the industrial sector was already facing and felt that any further constraints in the form of legislation regarding the environment would significantly and negatively affect industrial growth.

In answer to this, many of the other participants argued that the question was not really one of development vs. the environment. The proper way of looking at the issue was to think of it as development alongwith environmental conservation. Whereas, it was stated, that over emphasis on environmental preservation would lead to an unnecessary retardation of the rate of growth of our economy resulting in the country being weak enough for external forces to come in and exploit the very environment that was being preserved in the first place, however the lack of environmental consciousness would also lead to the weakening of our economic pace in not too distant a future. Therefore, an optimum policy has to be determined.

It was felt that despite the clear cut policy of the government, various agencies had a tendency to themselves take on the task of allocating priorities for national development. Specifically, it was pointed out that more or less every year the reports for the state and the central board for the prevention of water pollution contained passages like:

We have tried to take a lenient view of the industry keeping in view the country's economic position and the

need to encourage industrial development. It was felt that the various water pollution boards should strictly follow the law and they had no business to start interpreting the law and showing leniency to the industry.

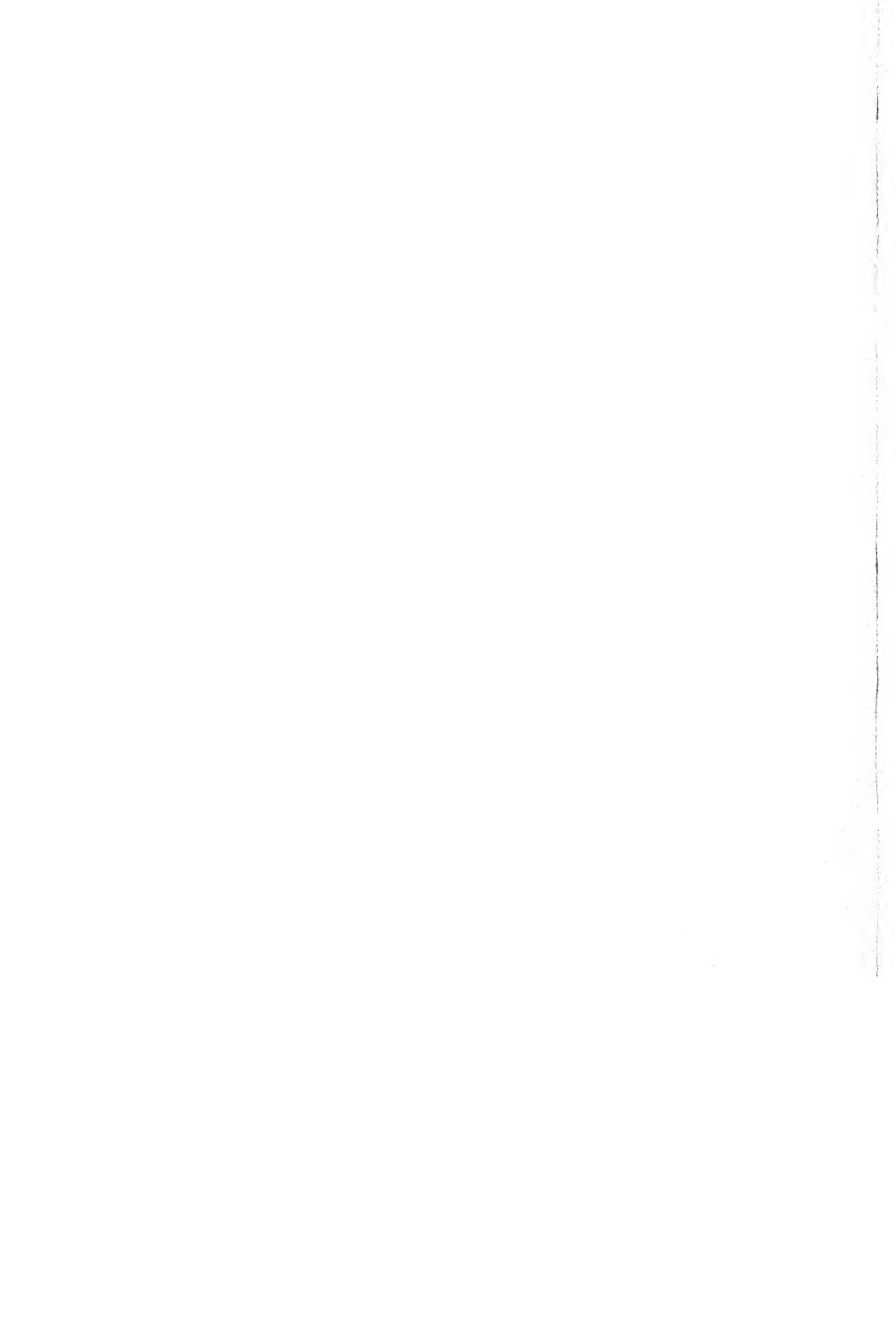
It was also stated that despite various efforts, no proper information regarding the type of pollution, its quantum and its location was available. As such, the Department of Environment should take note of this and start publishing authentic data regarding environmental conservation at the earliest.

The author of the paper clarified that the government had no intention to stop development projects even if they were environmentally destructive, the government only wanted to ensure that for whatever natural resources were destroyed a similar amount should be replaced.

Stressing on the need to develop a more equitable distribution of resources and wealth internationally, it was pointed out that in a recent UN Conference on Science and Technology there was a mention that in 1840 the per capita income of the industrialised nations, in relation to the developing nations, was 2:1. In 1940 this ratio became 10:1 and in 1980 it is seen as 30:1. This means that we are progressively declining as far as per capita income goes. All efforts must be made to stop this trend.

As a suggestion to ensure that industrial houses installed the pollution control devices that each factory required, it was suggested that financial institutions should not release the last instalment of their loan unless such devices have been fixed.

Most of the participants felt that whatever the laws and policies, the environment would never be properly protected unless the press and voluntary organisations came into the fray and fought for a rational environmental policy. □



SESSION III

ENVIRONMENTAL PROGRAMMES OF THE GOVERNMENT OF INDIA

DILIP K. BISWAS
P.K. BANNERJEE

The programmes relating to environmental protection and economic development are by and large interlinked and complementary to one another. As such, in India, some aspects of environmental protection, namely, soil conservation, public health, protection of forests and wildlife, industrial hygiene, water supply and sanitation, etc., have been included in the development programmes right from the initiation of the Five Year Plans. However, the concern for integration of environmental considerations in the process of planning for economic development was for the first time explicitly articulated in the Fourth Five Year Plan (1969-74). The plan drew pointed attention to environmental issues in the following words:

It is an obligation for each generation to maintain the productive capacity of land, air, water, and wildlife in a manner which leaves its successors some choice in the creation of a healthy environment. The physical environment is a dynamic, complex and inter-connected system in which any action in one part affects others. There is also the interdependence of living things and their relationships with land, air and water. Planning for harmonious development recognizes this unity of nature and man. Such planning is possible only on the basis of a comprehensive appraisal of environmental issues, particularly economic and ecological. There are instances in which timely, specialised advice on environmental aspects could have helped in project design and in averting subsequent adverse effects on the environ-

ment, leading to loss of invested resources. It is necessary, therefore, to introduce the environmental aspect into our planning and development. Along with effective conservation and rational use of natural resources, protection and improvement of human environment is vital for national well-being.

NATIONAL COMMITTEE ON ENVIRONMENTAL PLANNING AND COORDINATION (NCEPC)

In order to provide a point in the structure of the government where environmental aspects could receive close attention, the National Committee on Environmental Planning and Coordination was established in 1972. During 8 years of its existence, the committee was involved in a number of activities leading to important policy decisions, laying down of standards and guidelines to safeguard the environmental quality.

Under the terms of reference assigned to it, a major objective of the NCEPC aimed at:

Promoting research in environmental problems and establishing facilities for such research wherever necessary.

The research programme of NCEPC has been implemented through Indian National Man and the Biosphere Committee (MAB) and the Environmental Research Committee (ERC). The general areas of environmental pollution and its impacts, environmental aspects of human settlements, rural environment and other related subject areas are covered by the Environment Research Committee. The ERC also encourages action and demonstration projects which would serve to transfer the research results to the fields. The projects funded by the ERC includes studies on air and water pollution monitoring and control, instrumentation, energy use, settlements planning, pesticide studies and environmental education, etc.

The Man and the Biosphere Programme is in unison with the international effort initiated by the UNESCO. Under this programme, the primary objective is to study the impact of human interference on the natural ecosystems. The pro-

programme focuses its attention on certain ecological aspects of environment and has accepted the following 14 project areas relating to the effects of human activities on the biosphere:

- (i) Ecological effects of increasing human activities on tropical and sub-tropical forest ecosystems.
- (ii) Ecological effects of different land use and management practices on temperate forest landscapes.
- (iii) Impact of human activities and land use practices on grazing lands.
- (iv) Impact of human activities on the dynamics of arid and semi-arid zone ecosystems, with particular attention to the effects of irrigation.
- (v) Ecological effects of human activities on the value and resources of lakes, marshes, rivers, deltas, estuaries and coastal zones.
- (vi) Impact of human activities on mountain and tundra ecosystems.
- (vii) Ecology and rational use of island ecosystems.
- (viii) Conservation of natural areas and of the genetic material they contain.
- (ix) Ecological assessment of post management and fertilizer use on terrestrial and aquatic ecosystems.
- (x) Effects on man and his environment of major engineering works.
- (xi) Ecological aspects of urban systems with particular emphasis on energy utilization.
- (xii) Interactions between environmental transformations and the adaptive, demographic and genetic structure of human populations.
- (xiii) Perception of environmental quality.
- (xiv) Research on environmental pollution and its effect on the biosphere.

So far, over 120 projects have been funded under the Environmental and Ecological Research Programme through the MAB and ERC.

In addition, several other agencies such as University Grants Commission, CSIR and Department of Science and Technology have funded a number of research projects in

various sectors of environmental concern. These projects have been useful in providing the baseline data to characterize the existing state of the environment and to determine its trends. The network of such research projects has provided a base for building up professional competence and training personnel in the field of environmental management.

The NCEPC has also made efforts to generate multidisciplinary projects on environmental problems of national importance. For instance, a project for investigation of the long term environmental and ecological impacts of the river valley scheme in Idduki, Kerala, may be mentioned. Similarly, a proposal for the study of the ecological impacts of the Beas-Sutlej Link has been formulated. A proposal for an All India Coordinated Programme for studies on heavy metal pollution has also been worked out. To study the environmental problems in mining activities, an expert group was constituted. The group has brought out a state-of-the-art report on mining and environment, and has made several specific recommendations to serve as guidelines for the mining authorities. A similar group is now dealing with the environmental problems in metallurgical industry.

The NCEPC, during the past few years, has been involved in environmental appraisal of projects of varied nature and magnitude. One of the earliest exercises of the NCEPC in the appraisal of projects from environmental angle was the Nhava-Sheva fertilizer project. Considering the possible adverse effects that may arise if a huge fertilizer complex was to be started in Bombay's twin city and considering the needs of regional development, the NCEPC recommended that the fertilizer project should preferably be set up on the Ratangiri coast. A Task Force was constituted by the NCEPC to investigate the environmental implications of another fertilizer project at Rewas, Maharashtra. The recommendations of the Task Force led to the decision for finding an alternate location as the site earlier proposed was found unsuitable from environmental viewpoint. The NCEPC has also looked into the environmental aspects of the proposed fertilizer projects in Gujarat. Detailed investigations regarding the suitability of different locations *vis-a-vis* environmental implications were undertaken in these assignments.

Similar exercise from the viewpoint of safeguarding the environment was conducted for the 5000 TPA, DDT Plant in Rasayani, Bombay. Adequate pollution abatement technology was made mandatory before the project was cleared from the environmental angle. Recently, a monitoring committee has been set up which is looking into the environmental implications of four major projects in Bombay. These are Nhava-Sheva port, ONGC base and offshore drilling platform at Nhava Sasoon Dock and the Thal Vaishet fertilizer township. Another special group headed by the Chairman, National Committee on environmental Planning (as it is now named since its reconstitution in April, 1981) is studying the environmental aspects of the proposed link between the old and new Bombay. A Board has also been set up under the chairmanship of the minister of state for environment to look into the various measures as required to protect the unique natural environment of the Doon Valley and the watersheds of the rivers Yamuna and Ganga, which flank the valley.

Among other exercises in this field, a mention could be made of the deliberations on the possible environmental impact of the emissions from the Mathura Refinery. Detailed studies on meteorological modelling and damage of effects on marble have been carried out with direct involvement of the NCEPC.

An early exercise in nature conservation was the Chilka Lake development study which threw up a number of suggestions on the location of a Naval Boys Training School on the shores of the lake and the economic development of the lake area in general. Perhaps the most successful of the effort was NCEPC's intervention with the Tamil Nadu State Government on the question of constructing a hydro-electric power generation project right in the heart of the Mudumalai Wildlife Sanctuary in Nilgiris. A team constituted by NCEPC visited the area and had detailed discussions with the state government representatives and the benefits of the project were far outweighed by the ecological damage that would be caused. The project was given up by the state government.

The Western Ghats constitute one of the most significant geographical areas in the country having rich reserves of flora and fauna. This region also plays a vital role in the

climate, water regime of a large hinterland, spread over the States of Maharashtra, Kerala, Karnataka and Tamil Nadu. In a few years, the Western Ghats will witness the completion of a number of large scale projects on mining and power generation. These activities will have significant ecological repercussions unless proper safeguards are ensured. In order to evolve suitable guidelines for being recommended to the concerned state governments and central authorities in ensuring minimal adverse ecological impact in the execution of development projects, a Task Force was constituted. Based on the report of this Task Force, several important recommendations have been made to the concerned agencies.

The NCEPC has been in close contact with the Planning Commission in evolving a mechanism for assessment of environmental implications arising out of development projects and in providing necessary safeguards. Pursuant to the interaction with the Planning Commission, questionnaires for environmental impact assessment have been prepared for: (i) industrial projects, (ii) construction of roads and railways, (iii) mining projects and (iv) hydro-electric power generation and irrigation projects. Environmental appraisal committees have been set up for indepth examination of environmental aspects in respect of projects that are referred to the NCEPC by the concerned authorities (Planning Commission/Central Electricity Authority/Central Water Commission).

The above exercises have been useful in assisting the project sponsors to identify the potential environmental implications and to incorporate the necessary safeguards. Project appraisal from the environmental angle is still a relatively new concept even in most advanced countries. To conduct such an appraisal in the Indian context needs an insight into the problems peculiar to local situation.

In the field of nature conservation, one of the key programmes has been the identification of areas in the country deserving to be designated and managed as biosphere reserves. An inventory of such areas has been prepared through an Expert Group of the MAB Committee. Detailed surveys and management plans have also been worked out in respect of some of these areas such as Nilgiris in the Western Ghats,

Numdapha in Arunachal Pradesh and Tura Gene Sanctuary in Meghalaya.

The wetlands (shallow water bodies) constitute a resource of great economic, cultural, scientific and recreational value. In addition to the important ecological functions as regulators of water regimes, the wetlands provide habitats of characteristic plant and animal communities. Many wildlife species also depend on these water bodies for their survival. Particular mention may be made of aquatic birds like waterfowls. A nationwide survey of wetlands was conducted to collect baseline information on the nature and distribution of wetland ecosystems in the country. An expert committee evaluated the information and suggested suitable areas to be designated as waterfowl habitats of international importance. A map on important wetlands and wildlife in various regions of the country has also been prepared.

The explosive spread of noxious weeds in water bodies has been of great concern because of its interference with the efficient utilisation of water resources and concomitant problems. The situation has been further aggravated by increasing pollution loads due to indiscriminate discharge of industrial effluents and run-off from agricultural fields. Building up dams, reservoirs and development of irrigation network have also provided new habitats for noxious aquatic weeds. A survey of aquatic weeds was conducted to assess the nature and magnitude of problems in different parts of the country.

Evolving institutional mechanisms for environmental management engaged the attention of NCEPC since its inception. NCEPC strongly felt the need for setting up nodal agencies at the level of states and union territories for incorporation of any environmental concerns in the development planning of different regions. At the instance of the NCEPC, high level environmental boards have been constituted in various states and union territories.

Particular emphasis has been placed by the NCEPC on programmes for stimulation of environmental awareness, through formal and non-formal means. From time to time, NCEPC also organised seminars and workshops on subjects of environmental concern.

On the advice of NCEPC, a National Fellowship Award on Environmental Science has been instituted. The Pitambar Pant Award, as it is named after the first chairman of NCEPC, is intended to promote excellence in environmental research.

A Source Book on Environmental Activities containing details of the environmental information from various sources in the country has been brought out. The Source Book has been useful to those who are seeking specific information on matters relating to environment.

NCEPC also advised the government on programmes for cooperation in the field of environment with international agencies such as UNEP, UNESCO and IUCN, as well as through bilateral and multi-lateral agreements.

LEGISLATIVE MEASURES AND ADMINISTRATIVE MACHINERY

In accordance with the Directive Principles (articles 48 and 51-A) of our constitution, protection and improvement of the natural environment (including forests and wildlife) is an obligatory responsibility of the State and every citizen of India.

The overriding concern for ecological security has also been stressed in the National Policy for Economic Development. The Sixth Five Year Plan (1980-85) framework document as approved by the National Development Council states: "It is imperative that we carefully husband our renewable resources of soil, water, plant and animal life to sustain our economic development. Over-exploitation of these is reflected in soil erosion, siltation, floods, and rapid destruction of our forests, floral and wildlife resources. The depletion of these resources often tends to be irreversible and since the bulk of our population depends on these natural resources to meet their basic needs, particularly of fuel, fodder and housing material, it has meant a deterioration in their quality of life." The document also spells out the objective of the plan which is as follows:

Bringing about harmony between the short and long term

goals of development by promoting the protection and improvement of ecological and environmental assets.

The constitutional directives and development policy have provided a strong base for enactment of legislative measures as required for environmental protection. There are several laws enacted from time to time which are directly or indirectly related to environmental protection. Among them, the more recent ones are the Insecticides Act, 1968, Wildlife Protection Act 1972, Water (Prevention and Control of Pollution) Act 1974, Water Pollution Cess Act 1977, Forest Conservation Act 1980 and the Air (Prevention and Control of Pollution) Act 1981. Some of the older laws such as Indian Forest Act of 1927 are recently under review.

In recognition of the need for a fresh comprehensive look at the administrative and legislative aspects of environmental protection, the Government of India constituted a high powered committee headed by the Deputy Chairman of the Planning Commission. The committee in its report (September 1980) recommended that a Department of Environment should be set up to provide explicit recognition to the pivotal role that environmental conservation must play for sustainable national development. The functions of the Department of Environment were identified as:

- (a) 'Nodal' agency for environmental protection and eco-development in the country.
- (b) Carrying out of environmental appraisal of development projects through other ministries/agencies as well as directly.
- (c) Administrative responsibility for:
 - (i) Pollution monitoring and regulation.
 - (ii) Conservation of critical ecosystems designated as biosphere reserves.
 - (iii) Conservation of marine ecosystems.

DEPARTMENT OF ENVIRONMENT AND ITS PROGRAMME

As recommended by the committee, the Government of India set up a Department of Environment w.e.f. 1st

November, 1980. Through the creation of the department, an administrative set-up has been identified in the structure of the government for dealing with various aspects of environment and ecology. Some states, namely, Karnataka, Uttar Pradesh and Madhya Pradesh have also set up departments of environment at the state level.

A strong programme of environmental research and development will be supported to generate the kind of information and data required for the formulation of environmental policy. Standards and criteria for environmental quality relevant to Indian conditions particularly in the field of human settlement planning have to be worked out through carefully planned research schemes. Low cost methods for environmental protection, methods for energy, water and other resources conservation, recycling and re-use in all sectors of the economy, are some of the other objectives to be pursued.

In order to ensure that plans for development in all sectors are in harmony with the goal of maintaining the health of life-sustaining ecosystems and other environmental resources, the process of Environmental Impact Assessment (EIA) will be made an integral part of the entire planning process. The cost of pre-project studies related to EIA will be built into regular projects costs. Special case studies relating to environmental impact from the execution of projects in various sectors (industry, mining, irrigation, power, forestry, settlements, etc.) will be carried out. A system to monitor the compliance of project authorities with stipulations made at the time of conducting the EIA is to be established with the help of other agencies at the central and state level.

Monitoring of environmental quality is a critical function of accurate information on the success or otherwise of programmes for environmental production. It will also enable optimal deployment of resources and determination of areas in which urgent action is required. Environmental quality will be mentioned through a number of carefully chosen indicators (physical, chemical, biological, socio-economic, etc.) in various fields such as agriculture, forestry, mining, rural and urban settlements, etc. Programmes for the development of infrastructure required in this regard (hardware,

expertise etc.) will be strengthened or where necessary initiated afresh. This work will be coordinated by the Department of Environment, but will be carried out in their respective sectors by various other departments/ministries/agencies of the central and state governments.

The plan envisages the setting up of an Environmental Information System for the collection, processing and dissemination of environmental information that will aid planners, decision-makers and researchers. In order to avoid duplication of effort (particularly in fields like natural resource management, in which a number of agencies are already serving as repositories of information) the system will work on a distributed data-base concept. As a part of the activity, a documentation and publication centre will regularly bring out status reports, research monographs, case studies and other relevant material to serve the information needs of the general public.

Programmes to increase public awareness about environmental issues and to stimulate public participation in activities for environmental protection will form a key component of this plan. Particular emphasis will be given for communication programmes for target groups such as village panchayats, district and municipal authorities, state and central legislators and administrators. Apart from the use of non-formal means (mass media, performing arts, etc.) for public education, formal environmental education will be considerably strengthened at the primary, secondary and tertiary levels through inputs into the relevant curriculae, sponsoring of publications and training workshops.

In response to the identified need for strong research development and training support to programmes for environmental protection it is proposed to set up a number of centres/institutions for studies/training in environmental science, technology and management. This would be accomplished both by strengthening institutions already working in this area and by setting up a small number of new institutions. Using a network of existing institutions it is proposed to set up a Centre for Himalayan Studies and a Centre for Western Ghats Studies. The latter would lay emphasis on the study of tropical rain forests. The new institutions would include an

Institute for Environmental Management, a Wildlife Research and Training Institute and a Centre for North-East India Studies.

The Department of Environment will sponsor a number of field action programmes. These will include demonstration projects that illustrate successful tools, techniques and methodologies for environmental protection in fields such as land reclamation, low-cost pollution control, recycling/reuse of waste materials, mass communication of 'environmental messages'. Collaborative programmes with other governmental bodies, municipalities, forest departments, voluntary agencies will attempt to directly accomplish clearly defined objectives of 'eco-development' in local or regional contexts. Such projects would include tree planting, weed eradication, community waste collection and reuse, 'cleaning' of water bodies, involvement of local communities in protection of forests, wildlife, etc. Emphasis is to be given for projects involving youth in eco-development activities through summer camps. Thus particular emphasis will be given to the involvement of voluntary social organizations, groups of scientists or individuals in various facets of environmental protection at the field level. A provision is being made for grants-in-aid to such groups who can be of great assistance to government in carrying out activities that mould public opinion and elicit cooperation in favour of programmes to conserve the wisely managed environmental resources.

In order to accelerate the process of repairing the damage already done to fragile hill ecosystems, an eco-development force consisting of ex-servicemen will be set up. Such a force will consist of discrete units which will be deployed to begin with in the upper catchment areas of major Himalayan river systems. The various units of the eco-development force will take up a massive afforestation and soil conservation programme and also assist in harnessing rain water for subsequent use both for domestic and agricultural purposes. The force together with the local community will take steps not only to develop hill eco-systems and forests but also to produce the needed quantities of fuel and fodder without damage to forests.

Another step which will be initiated by the Department

of Environment will be the organization of eco-development camps consisting of students from the different universities in the country. Each eco-development camp will have a specific goal such as the repair of a damaged eco-system, setting up of a marine or desert national park, biosphere reserves, organisation of village fuel wood plantations, etc. For each camp, selected groups of students drawn from a mixture of universities will be trained in relevant tasks before the work of the camp is started. Thus this programme will be to foster team work among students drawn from different parts of the country in executing a developmental task of both ecological and educational value.

The role of the state governments in ensuring a coordinated approach to environmental protection has been recognized to be crucial. The DOE will play a catalytic role in strengthening of capabilities of state governments in carrying out environmental planning, protection and review. This will be through joint participation in studies, assistance, development of expertise and infrastructure, 'seed money' for carrying out studies and research programmes, etc.

Apart from its work in regulating and coordinating the work of pollution monitoring and control the DOE will be directly responsible for the major programmes of: (a) creation and management of biosphere reserves, and (b) monitoring and conservation of marine ecosystems. A separate cadre of specialists is to be constituted for management of the biosphere reserves which are to be set up under central control. Considerable preliminary work has already been done to identify potential areas of value to be designated as biosphere reserves.

It is proposed to identify an agency to be entrusted with the task of monitoring and planning for the conservation of the nation's valuable marine ecosystems. The agency will be adequately strengthened to carry out comprehensive research, design and development related to prevention of marine pollution, rational exploitation of marine resources and protection of particularly valuable areas and species of marine life.

A comprehensive programme to make an inventory of ecological resources of the country is to be undertaken. This

will be done in coordination with the Environmental Quality Monitoring and Environmental Information Systems programme described earlier. The work will be done in phases by using existing institutions such as Survey of India, Botanical and Zoological Surveys of India, National Remote Sensing Agency, etc., besides other ministries and agencies of the central and state governments. Data gathered from satellite imagery, aerial photography and field surveys will be processed and collated in selected institutions throughout the country and will be available to planners and decision makers.

DEVELOPMENT PLANS OF ENVIRONMENTAL SIGNIFICANCE

Soil and Water Conservation

Soil and water conservation programmes were initiated during the First Plan period and they have been progressively intensified over the successive Plan periods. Till 1979-80, an area of 23.40 million hectares was treated by various soil conservation measures against 18 million hectares at the end of Fourth Plan period (1973-74) and 21.7 million hectares at the end of Fifth Plan period (1977-78). During the First and Second Plan periods, soil conservation works mainly constituted of contour bunding and some afforestation of denuded areas. Under the Third Plan, a centrally sponsored scheme of soil conservation in catchments of 13 major river valley projects was undertaken. This was extended to another 8 catchments during the Fourth Plan period, and today this scheme is covering 21 catchments. From the Fifth Plan onwards, soil and water conservation programmes are being taken up on watershed approach. Others significant achievements of the previous plans include the setting up of the All India Soil and Land Use Survey Organisation and State Land Use Boards to take an overall view of the land-use, conservation problems, etc.

Considering the magnitude of the problem of land degradation, its regional and inter-state ramifications and high national priority accorded to tackle it, the Sixth Plan aims at a target of an additional 7.1 million hectares.

Forestry

The importance of forest conservation and afforestation can hardly be over-emphasised from the viewpoint of economic usefulness and ecological benefits. The 1952 National Forest Policy Resolution of the Government of India had recommended that the country should aim at a coverage of one-third of the total land area under forests. The position in this regard has been far from satisfactory, inasmuch as only about 23 per cent of the total land area is under forests and not more than 40-50 per cent of this has good forest cover. The remaining areas have been degraded and depleted due to demographic and commercial pressures. Efforts made in the past for rehabilitation of the degraded areas have met only with limited success.

Programmes of social forestry and economic and industrial plantations have been made under implementation for some time in different states with varying degree of effectiveness. Forest development corporations have been established in some of the states with a view to expand and speed up afforestation programmes by utilising institutional finance. Programmes for development of national parks, strengthening of research on endangered animals including Project Tiger were taken up during the Fifth Plan Period. Significant progress has been made in respect of economic and industrial plantations with an achievement of about 22 lakh hectares by 1979-80. Similarly, the area under plantations of quick growing forest trees has also increased substantially to cover about 14.9 lakh hectares by 1979-80. There is, however, urgent need and great scope for further improvement in forestry development all over the country.

The main objective of the forestry programme during the Sixth Plan period will be the conservation of existing forests and the launching of countrywide afforestation and social forestry programmes. Forest policy has to fulfil three sets of needs: (a) ecological security; (b) fuel, fodder and other domestic needs of the population; and (c) the needs of village, small scale and large scale industries.

Social forestry programme comprising two schemes, viz., (a) mixed plantation of waste lands, and (b) reforestation of degraded forests and raising of shelter belts was for some

time treated as a centrally sponsored programme, but with effect from 1979-80 it was transferred to the state sector. To intensify this programme in the districts where shortage of fuel wood is particularly acute, a new centrally sponsored scheme of social forestry including fuel wood plantation and farm forestry is being introduced in 100 selected districts.

In addition to strengthening and expanding on-going programmes in forestry research, education and development, the new programmes introduced during the Sixth Plan period include:

- (a) 'Trees for every child' programme to involve school children in tree plantation work.
- (b) Eco-development force of ex-servicemen for afforestation and soil conservation in degraded hill areas.
- (c) Eco-development camps of college students for voluntary work in tree plantation programme.

According to the 20-point programme recently enunciated by the government, one of the thrust areas will be the promotion of afforestation activities on massive scale.

Energy

The energy requirements in India are heavily dependent on the traditional fuels among which firewood is the most important one followed by agricultural wastes and animal dung. The ecological damage caused by extensive denudation of forests for fuel and other purposes is too well known to need any elaboration. Hence, energy forestry (plantations for firewood) is regarded as an important component of our energy strategy as the rural communities will continue to depend on firewood for several years to come. A programme of fuel and farm forestry has been taken up in the Sixth Plan, the target being set at 13 lakh hectares of plantation. To give impetus to the development and better use of renewable energy sources, the government has recently established a Commission for Additional Sources of Energy (CASE). The programme covers energy plantations, biogas, bio-conversion of wastes, tapping of solar, wind, tidal and other sources, which are intended to meet the growing energy

demands and to lessen the process of environmental degradation. The bio-gas programmes, as is well known, not only provide much needed energy but also yield valuable organic manure and improves environmental health. Recognizing the multi-faceted potential of such programmes, about one million family size plants and 100 community size plants are proposed to be installed in various parts of the country during the Sixth Plan period. The Sixth Plan envisages a significant increase in the allocation for research, development and demonstration programmes in new and renewable energy sources. An amount of Rs. 400 million has been earmarked for this purpose in the year 1980-85 in addition to Rs. 100 million for a project relating to magneto hydro-dynamic generation and other new technologies based on coal.

Water Supply and Sanitation

A national water supply programme was launched in 1954 during the First Five Year Plan and progressively larger allocations were made for water supply and sanitation in the succeeding plans. However, the progress so far made in providing safe water supply and basic sanitation facilities could hardly be called satisfactory. By March 1980, about two lakh villages in the country with a population of nearly 160 million were yet to be provided with potable water supply. The situation in the urban areas is relatively better but here too, particularly in smaller towns, water supply and sanitation arrangements are far from adequate.

Till the Fifth Five Year Plan, the programme did not receive a high priority in the national planning process. The importance of providing safe water supply and sanitation as a basic minimum need was stressed in the Five Year Plan (1974-79) which included drinking water for villages in its Minimum Needs Programme. The other important components of environmental significance which were introduced in this programme included the following:

- (i) Elementary education;
- (ii) Rural health;
- (iii) House sites for land labourers;

- (iv) Environmental improvement of urban slums; and
- (v) Nutrition.

During the Sixth Five Year Plan, added emphasis has been given for the Minimum Needs Programme. It is proposed that the activities to be covered under the programme will be supplemented by the wider programmes in the various social services sectors. In essence, the objective is to adopt an integrated systems approach. For instance, health care which is a component of the Minimum Needs Programme should be viewed in the perspective of a total system consisting of appropriate steps including environmental sanitation, supply of safe drinking water, nutrition, health education, immunisation and family planning.

The approach envisaged in the Sixth Plan is to provide at least one source of drinking water in every village identified as a scarcity or health problem village. The Sixth Plan provides an allocation of Rs. 2135 crores for water supply in the problem villages and other rural areas requiring improvement or augmentation of such facilities. Insofar as rural sanitation is concerned, the effort in the Sixth Plan is to make a modest beginning through pilot projects in all states which will help in making an assessment of community attitudes and nature of sanitation facilities needed. Keeping in view the present position of rural sanitation and constraints of resources, it would not be possible to provide sanitation facilities to more than 25 per cent of rural population by the end of the water supply and sanitation decade (1981-1990). However, much more can be done in this area through self-help schemes of voluntary organisations and village community.

As regards urban areas, the Sixth Plan lays considerable emphasis on the integrated development of small and medium towns and environmental improvement of slums. Water supply and sewerage schemes are to be dovetailed in the programme. Some effort has been made to evolve low-cost techniques for urban sanitation. A project through UNDP assistance has been initiated to promote water seal latrines in 110 towns. Pilot projects are to be taken up in different states to provide low cost sanitation and waste disposal. During the Sixth Plan, it is expected that about 930 urban water supply schemes

and 120 urban sewerage and drainage schemes will be completed. In addition, it is proposed that new schemes of water supply will be taken up in about 550 towns and sewerage schemes in 110 towns.

The programmes as mentioned in the preceding sections are not exhaustive but indicative of the various activities which have a direct as well as indirect bearing on environmental quality. As a matter of fact, the basic objective underlying the plans and programmes is to ensure a better quality of life of our people. In that sense, the entire plan for national development could be termed 'environmental'; particularly, those activities which are intended to correct the various local and regional stresses on environmental resources arising from conditions of poverty and under-development as well as unintended side-effects of the development process.

REMARKS OF THE PRINCIPAL DISCUSSANT

ANIL AGARWAL

Mr. Chairman, I must say that when Mr. Shekhar Singh invited me to lead the discussion on this paper, my instincts as a journalist were very much aroused and I was pretty delighted to take on the job. You can imagine that trying to rip apart a paper which has been produced by the government is always a job for journalists and I was very happy to go ahead and do it. But when I actually went through the paper, believe me it was a very pleasant surprise. The paper is an excellent one and Dr. Biswas and Dr. Banerjee need to be congratulated for the paper, and the Department of Environment needs to be congratulated for the various programmes it has launched. It certainly seems as if the Department of Environment and not the Committee on Environmental Planning have come up with a very well rounded plan of action. I thought to jot down the various thrust areas which seem to come out of the programmes and action which Dr. Banerjee described just now.

One major area seems to be the activities, programmes and projects which try to reduce the impact of new projects. You can also put in the environmental legislation the department was thinking of and the environmental legislation which already exists. Another area which comes out very strongly in the Department of Environment programmes is creation of new information and dissemination of information that already exists; one could say that research and information is the second area which comes out of the programmes.

Programmes which should primarily aim to meet certain basic needs like sanitation facilities, cooking energy and so on, but in a manner that would also be commercially sound, forms the third area. The fourth area that comes out of the govern-

ment programmes is conservation projects, projects aimed at conserving our wildlife and so on and so forth.

So, if you look at all this, it looks like a very well rounded programme, very well thought out and very useful in saving and protecting the environment. If I just stopped and said it is a very good programme and best wishes and go ahead, I am sure Mr. Singh would not be very happy. The thing that did come to my mind, as I was going through this list, is: what really are the priorities, what does this all add up to? And immediately the question arose in my mind—what do we mean by environmental management? What ought to be our country's environmental policy?

My own association with environmental issues is about a decade old. It was only by chance that I happened to go to the Stockholm conference: the UN Conference on Human Environment, in 1972 and at that time there was a tremendous interest in conservation. The whole environmental debate was conservational. We have got to protect the rivers; we have got to protect our mountains; we have got to protect our soil and our wildlife; and so on and so forth. But ten years is a long time and since then the debate has gone very far ahead. The whole discussion on environment has gone very far ahead and today, when we talk of environmental management, we essentially mean good resource management. Because, ultimately, what is the environment for?

I am personally very utilitarian and more and more people are thinking in terms of economic development programmes. Somehow the environmental issue has to fit into that and the only way it could fit in is when you think in terms of good resource management. After all, forests are a resource, rivers are a resource, even air is a resource and you have to repeatedly ask this question of how are we going to use these resources? And the moment you do that, a whole range of new questions open up. First, if we look at the current resource pattern, who do they benefit? Who do they harm? Answers have to be found to these.

You then also have to ask other questions like when does a resource become a resource, that is when does anything become a resource in a society. Take a small example, which has tremendous environmental implications: human excreta.

In China, it is a resource, in this country it is a waste product. Because it is treated as a waste product, it harms the environment and it harms the health. When will we turn it into a resource?

I will give you another example. You cannot see the environmental implications clearly but it has massive environmental implications. Fifty per cent of the people, or more than that, live in mud buildings and I cannot see a future in India at least for the next 50 years when people will not be living in mud buildings. But in how many architectural schools in this country, or for that matter anywhere in the world, is mud taught about as a building material, leave alone as an important building material. If you start thinking of how a society would use mud buildings, you would think in terms of massive rural housing programmes, urban housing programmes and so on, and probably the whole character of a city would change. So it becomes a question of technology choice, and it is in all this that the environmental programmes of any government have to fit in. All these questions have to be asked and somehow that did not seem to be coming out of the present paper.

What is it really that we are trying to achieve when we talk in terms of environment? I simply raise this point: leave the discussion open to everybody else. But again, when I became a journalist, a science writer, having graduated as an engineer, and this was in the early 70s, that was a time, just as today, when India was thinking of a science policy. The National Committee on Science and Technology had been formed, and everybody was talking of using science and technology for the development of this country: for a balanced rational development. At that time I remember reading that somebody had said: "There is more to science policy than just a policy for science". I think I would have to paraphrase once again in 1982: "There is more to a National Environment Policy than just a policy for environment". Thank you Mr. Chairman.

ABSTRACT OF DISCUSSION

Some participants suggested that there are at least three causes of air-pollution: one is large industry, second, is the automobile and the third is the domestic sector, including small industries. It was stated that for Delhi, industrial pollution was only 20 per cent of the total pollution, automobiles caused about 50 per cent of the pollution and domestic sources including small industries caused about 30 per cent. In Bombay, industrial pollution was about 30 per cent and the remainder was through automobiles and domestic sources. Whereas it was relatively easier to control large industries, at least technically and in terms of administrative procedures, and also easier to check automobile emission, controlling domestic pollution and the pollution from small industries was more or less impossible, especially as most of the small industries were not licensed and could not easily be brought to law.

One participant added:

"In this whole problem of industrial pollution one must remember the interests which are involved. Perhaps one or two examples can illustrate this well. One is pencils. Something like 80 per cent of the slate for India's total production of pencils is manufactured in Mandaur district, in Madhya Pradesh. Over the past few years, it is estimated unofficially that at least a thousand to three thousand workers have died there due to a disease called Sillicosis, which is caused because when the slate is cut its dust is inhaled by the workers. Two years back there was a very concerned press campaign about this. I believe there are laws according to which dust control machines are supposed to be installed. The cost of these machines runs into a few thousand rupees. There are something like 472 factories in which these machines were put up, but it has recently been reported that most of the machines installed are imitations of the actual machines and they, in effect, remove no dust. In other words, these workers are

still dying of Silicosis, which is an incurable disease. Once you inhale Sillica dust you just cannot be cured, and here is an example where in spite of all the official announcements at the state or centre or district level, the entire administration does nothing to ameliorate the condition of these workers. Yet this is just an instance. Virtually in every industry this is the case.

"Ninety-five per cent of our crackers are manufactured in Sivkasi district, where children work something like 12 to 14 hours a day in factories where not even elementary safety precautions are taken. Over the past few years, there have been so many accidents in which so many of these children have been killed. However, blatant violation of the safety regulations still continue and the law is simply not enforced. Whatever the law may be on paper, it is a fact that economic interests just do not let them be implemented.

"Take the instance of forests. Over the past ten years in Uttar Pradesh, especially in Uttarkhand, the Chipko andolan has been raising the problem of commercial forestry and been pointing out how this so-called scientific forestry is in effect unscientific. It is denuding our forest areas, and to counteract there is this sinister weapon, which one can only call government ecology, according to which it is the local people who are destroying the forests.

"The Prime Minister, and recently the President of India, have congratulated the Chipko movement and have pointed out its value. However, while at the highest level there is an appreciation of the problem and there is an 'appreciation' of the movement, at the ground level everything still goes on the way it was. Even today the contractor lobby continues. It may be under the guise of the Forest Development Corporation. You just exchange a forest official for a contractor. This is not to suggest that every forest official is out to cut every tree, but the sort of political and commercial interests that are prevalent just negate anything that these policy pronouncements are worth.

"So, Mr. Chairman, Sir, with your permission I would like to raise a very important question: How does one counter these economic interests and are these laws and these policy pronouncements adequate? It appears that these policy pro-

nouncements are made for the record. They are entirely on paper. When it comes down to action, vested interests successfully thwart any move. Though, for instance, there are several cases where landless people and small farmers have cleared forests, established small farms, and been evicted, there are several cases where politically powerful persons in Karnataka and in Uttar Pradesh as in every other state, take thousands of acres of land illegally and in blatant and open violation of laws, and the government simply does not act. So, we just cannot take this up in terms of policies and laws, we have to look at the real environment, the social environment, the economic environment and the political environment in which these problems have to be solved."

Some participants argued that there was a fourth and very important source of pollution, this being agriculture. Considering the quantum of pesticides and insecticides being used today, modern agriculture was a very significant contributor to air and water pollution and contributed highly toxic and dangerous pollutants.

A suggestion, that was repeatedly made, concerned the government declaring an Annual Calendar of Environmental Programmes. It was suggested that Government of India should every year, or half-yearly, bring out a calendar which indicated the major environmental problems, methods proposed to tackle them and the time frame within which the government proposed to do what was necessary. This would not only enable the government to work within a time frame, but would also allow voluntary agencies and the people to make the government answerable for its lapses, and pressurise the government to take the necessary steps.

It was pointed out that whereas a lot of discussion had taken place regarding forests, land, water, wildlife, pollution and the other such topics, nothing much had been said about marine ecology. Some participants felt that our coastal areas were under tremendous environmental threat and that the government should urgently take steps to protect these areas. One of the main causes for environmental degradation in the coastal region was the introduction of mechanized trawlers for fishing. These trawlers not only displaced a

large number of fisher-folk from their traditional occupations but also were ecologically disastrous. Trawling very often involves drag-netting the sea bed for shrimps and prawns: an activity which both destroys the eggs of various fish, including the shrimps and prawns that are being harvested but also stirs up the mud thereby making it impossible for certain other species of fish to survive. Apart from this, the sound of the trawler engine and its effluents in the form of diesel and oils, also have an adverse effect on the marine ecology.

Opposing the pessimism that seemed to be prevalent, some participants pointed out that already there was a quick growing concern for environmental issues, this being obvious from the legislations and laws and from the setting up of the department of environment. It was felt that if such an awareness continued to grow, a very good background for solving the problems of the country would be established.

Some people pointed out that even now, while projects were being planned, environmental considerations were subsidiary and peripheral. However, it was felt that all project proposals should have the environmental dimensions as an integral and important part.

Talking about water pollution, some participants pointed out that pollution was both a function of effluents as also a function of the quantum of water available. This made the task of monitoring bodies like the Water Pollution Control and Prevention Board, very difficult. Though the board could regulate the quantity and composition of the effluent, they had no control over the quantum of water in the river, or other water ways, into which the effluents were released. This often led to confusion and mismanagement.

Some people felt that the Water Pollution Act was not realistic as it prescribed a minimum punishment of six months imprisonment for anybody convicted. This led to both the board dropping charges and to the courts acquitting the accused, as generally six months imprisonment was considered too harsh a punishment for what might very often be technical error. This point also highlighted the general issue that for laws to be effective, the right socio-economic environment must be created.

People talked about problems regarding location of an industry. It was felt that if enough thought was given before an industry was located, not only would the environment be protected, but the cost involved in environmental control would be significantly reduced. The example of the Mathura Refinery was often quoted. Many participants felt that if the refinery had been located elsewhere, it would have been ecologically and economically preferable.

In response to a statement that all departments of the Government of India now had officers who were required to act as environmental watch-dogs, it was clarified that though the Tiwari Committee recommended this, very few departments had yet implemented it.

Further, even if such officers were appointed, it was felt that they would be resented and treated as mere bottlenecks to the process of development. An example was given of the financial adviser in each department, who was often considered to be a factor inhibiting proper development and growth of the activities of that department. It was, therefore, felt that some other mechanism should be evolved, in order to perform the essential watch-dog function.

Remarking on the lack of uniformity in India regarding the required standards for pollutants and other environmentally sensitive material, it was stressed that no rational implementation of the law could take place unless a universal standard was provided throughout the country. Perhaps the Indian Standards Institution should be involved with this.

SESSION IV

PEOPLE'S PARTICIPATION IN CONSERVATION

SHEKHAR SINGH

INTRODUCTION

Despite the fact that India has what is perhaps the longest history of environmental conservation, the situation today is such that people from various walks of life, and academics from diverse disciplines, are more and more beginning to feel that environmental management is a priority area and that it well deserves at least a part of their energy and time. The ageold belief that it was only the 'shikaris' and the wog's, with an interest in orchids and birds, who should rightly be worried about deforestation and other forms of ecological violence is slowly giving way to a real appreciation of what environmental management and conservation mean to national development.

HISTORY OF CONSERVATIONAL EFFORTS

"Almost all speeches and articles on nature conservation in India dwell upon the long history of the nature conservation movement in India. Here, wildlife has since times immemorial enjoyed a privileged position of protection through religious myth and sentiment. In the ancient Vedas some 30 different animals are mentioned by name. The elephant is Indra's favourite; Hanuman the Langur monkey helped Rama in his classic battle against Ravana. The deer is always associated with Brahma, while the lion is one of the many incarnations of Vishnu. The earliest known record of measures taken for the protection of animal life comes from India,

namely the Fifth Pillar Edict of King Asoka by which game and fishery laws were introduced into northern India in the third century B.C. Indeed, nature and wildlife has been part and parcel of India's religion and cultural tradition and for the many still deeply religious Indians this has not changed much. During the most recent turbulent history, however, this tradition of preservation was partially lost. During the last two centuries much hunting by the British and by the Indian Rajas, Nawabs and Civil Servants took place. In the princely states all forests and wildlife belonged to the Raja and protection was generally good, because the Rajas could punish as they pleased. In the areas under direct British rule enforcement of existing laws was rather poor and there was much shooting, poaching and deforestation. India's first wildlife law was enacted in 1878."*

In the 19th and early half of the 20th century, efforts at the conservation of nature appear to be primarily with the objective of preserving plentiful game for the hunters and anglers. It was mainly in the form of a discipline imposed upon the shikaris to ensure that no species of game became extinct. Some preserves were also set up to make the task of the 'burra sahib' hunters somewhat more rewarding. There was hardly a senior army officer or civil servant of the time who did not have an impressive tally to his name, and stories of visiting dignitaries bagging twenty or more tigers is legend. To get the flavour of the voluntary agencies, so to speak, existing around the turn of the century I give below extracts from the Annual Report for the year ending June 30, 1893 of the Nilgiri Game and Fish Preservation Association:

"*Sambhur*: There is still a great scarcity of good stags, and such scarcity must continue so long as licence-holders and others butcher small brockets. In the deer forests of Scotland, of Exmoor, in Germany, Newfoundland and many other places, none but 'warrantable' stags are allowed to be shot. On these hills, there is nothing whatever to restrain any one but his own feelings of humanity and sport.

'For the Mudumalai Forest, however, special rules have

*From *Report on a Study Tour on Nature Conservation*, (mimeo), Agricultural University, Wageningen, the Netherlands, 1978, pp. 9-10.

been published, which prohibit the shooting of brockets. These rules have been in force from July 1, 1982, and have worked satisfactorily.

"Spotted deer: The wild dogs have done much damage to these deer during the year. A pack of over 40 dogs appeared in the Sigur Forests and killed deer every day for some months, when the pack suddenly broke up into twos and threes. Nine dogs were found lying dead in the forests. Mr. Liebenrood also reports that he found 3 wild dogs lying dead in the forests near Nellakotta. The presumption is that distemper or some other disease broke out in the pack. Some such cause must operate in keeping wild dogs in check, or they would rapidly increase and overrun the whole country.

"Other societies: The Dehra Dun Fishing Association has been very unfortunate. After the expenditure of Rs. 900 and infinite trouble, only 4 fry out of 10,000 ova were put out into the Ro. Nadi. May they have greater success next time!

*"In Ceylon the trout fry put out into the Newara Eliya streams seem to have thriven, but do not increase. These fish are of considerable size and come into the runs to spawn on the gravel, when it is found necessary to have guards put on to prevent them being netted and stolen."**

Apart from voluntary agencies, even the governmental interest was mainly aimed at maintaining well stocked forests and streams. Perhaps the pressures of population were not felt then, however, one can't help wondering what the scenario would have been today if the powers that be in the last century had a greater understanding of environmental management.

I annex extracts from reports prepared by senior forest officers around the first quarter of the century: reports which very powerfully bring out the concerns and thinking of the administration then.

PEOPLE'S PARTICIPATION—A CONCEPTUAL ANALYSIS

Without being tedious, one can identify at least three functions that the people can play in terms of general develop-

*From *Journal of the Bombay Natural History Society*, Vol. VIII, 1893, pp 535-539.

ment programmes and projects, and regarding environmental conservation in particular:

1. The people can be responsible for initiating thought and action regarding specific issues: a catalytic role.
2. They can give advice to the government and other agencies regarding the strategies and objectives of specific efforts: a consultative role.
3. They can physically participate in the implementation of programmes and projects: an implementative role.

Needless to say, participation can be both with the government and in opposition to it. Thinking and action can be initiated against an official policy or decision, advice can be given on why the policy should be changed and, finally, if necessary, action can be taken to prevent the implementation of the undesired policy.

Such a model of people's participation raises, especially in a democracy, certain fundamental issues:

Where it is participation against the government:

- Why is it necessary for the people to agitate against government policies when, in a democracy, the legislatures and the parliament are supposed to represent the people's views?
- Is it because these bodies are no longer representative?
- Is it because the common man realises the implications of environmental degradation much more clearly than his representatives or his government?
- Is not such an intervention both an inefficient way of development, considering the internal forces neutralised in opposition, and also doomed to achieving at best marginal success?
- Is it because specific groups of people only look to their own interests while the government has to think of the overall benefits?
- Is it not true that either the government does not represent the people, and ought therefore to be chang-

ed, or that the people do not understand what is most desirable, and ought therefore to be educated? Or is it a bit of both?

Where the people 'participate' in support of the government:

- Why is it that only programmes for the benefit of the poor man need people's participation—mainly in the form of free labour?
- Trees get planted in posh areas, and ministers' and officers' gardens get looked after without people's participation—then why not rural afforestation or cleanliness?
- Are not the people, by participating in such programmes, on the one hand allowing the government to get away without facing the consequences of their inaction and, on the other, allowing them to spend disproportionate amounts of money on unessential items? (The ASIAD constructions were completed without people's participation—in fact in spite of it, however any rural programme, or even construction of houses in resettlement colonies in a city requires people's participation).
—Perhaps 'people's participation' is a cheaper way of getting things done, but where goes the money that is saved?

PEOPLE'S PARTICIPATION IN CONSERVATION—A REVIEW

To determine which of the various popular movements, stirrings and campaigns can rightly be determined to be people's movements for conservation is not a simple task. Most often what might appear, at first sight, to be concern for the natural environment might finally turn out to be really a battle between two vested interests, or a hidden strategy for exploitation. Without being actually involved in the movement, it becomes difficult to always identify its true nature. I have, therefore, decided to discuss mainly three campaigns: two of which are very well known and have been already subjected to

rigorous public debate, and the third, though mainly unknown, I would talk about for I myself was involved in it.

THE 'CHIPKO' MOVEMENT

So much has already been written about the Chipko movement, that to repeat even a part of it here seems quite unnecessary. Besides, it is not the details that interest us in this paper. What I would like to examine is the general principles that emerge from the movement, and to see how these general principles can be put together in a model which is perhaps replicable and desirable.

Some dispute seems to exist about the start of this movement. Sunder Lal Bahuguna, who is often considered to be the founder of the movement, says:

I do not claim to be the founder of the Chipko movement. It was due to Sarvodaya activities in the Uttarakhand region that this non-violent movement was born. The credit goes to the women of Chamoli district who for the first time in April 1973, declared that they would literally embrace the trees if a sports goods company attempted to axe the ash trees. Their demonstration was repeated all over Uttarakhand, at several places where trees were threatened to be axed. Later in 1978, they actually confronted the men and the armed police sent to help the contractors' axemen.*

But even here, it first started off not as a movement for conservation but mainly as a fight against socio-economic exploitation:

Though the main demand of the Chipko movement in 1973 was an end to the contract system of forest exploitation and allotment of raw materials for local, forest-based industrial units, on concessional rates, since then there has been basic change in the objectives of the movement. It has developed into an ecological movement of permanent economy from a movement of short-term exploitative economy. The move-

*From letter to *Indian Express*, February 6, 1982.

ment is striving to get the scientific truth accepted that the main products of the forests are oxygen, water and soil.*

Nevertheless, today the 'Chipko Andolan' is looked at by many people as the first true ecological movement of the people, and there are constant efforts to widen its area of influence and to replicate it elsewhere.

Undoubtedly, it has had the following success:

1. It has slowed down, if not totally stopped, the process of deforestation in the Uttarakhand region and in other hill areas of U.P.
2. It has exposed the vested interests involved in the mass destruction of forests.
3. It has given the people of the region a rallying point to collectively oppose the exploitation of their natural resources.
4. It has created an awareness among the people regarding the implications of ecological destruction.
5. It has demonstrated the workability of a powerful model of people's participation, a model that can be emulated and replicated

SAVE THE SILENT VALLEY MOVEMENT

The effort to save Silent Valley, in Kerala, is also well known today and has been debated at various levels for the last six years or so. Basically, without going into the merits or demerits of the issue itself, the movement as such has three main constituents.

First, there are the people of Kerala, many of whom feel that the construction of the dam and hydro-electric power station in Silent Valley should be abandoned. This group of Keralites have vocally and persistently campaigned against the project, very often under the umbrella of various local organisations like the Kerala Sastra Sahitya Parishad, the Society for Protection of Silent Valley and Da vinci Environmentalists, among others. These local people petitioned the

*From letter to *Indian Express*, February 6, 1982.

government, attempted to educate the common public and to publicise the issue through newspapers. They fought hard to get a proper assessment of the project done.

"In the meantime, the campaign to save the valley was gaining momentum. The KSSP's (Kerala Sastra Sahitya Parishad) approach appealed to the people. A cycle rally and jeep rally were made to the valley from Calicut and Quilon. At Payyannur in North Malabar, a *hartal* was observed as a result of a call given by the Nature Action Group and Zoological Society of the same place. Save Silent Valley Day was observed throughout the state by the various nature clubs. The KSSP held public meetings in various places in the state. An article written by the eminent journalist Sri B.G. Verghese also contributed to the public awareness. The Gandhi Peace Foundation joined the campaign now. Appeals were made to the central and state governments by dignitaries like the former central minister and president of WWF—India, Sri H.M. Patel and Sri Chandrashekhar, the Janata Party leader. At about this time Sri David Monroe, the President of the IUCN, wrote a letter to the state chief minister urging him to drop the project. Of course, this fell on deaf ears. In 1978, a mass memorandum was submitted to the chief minister. None of these made any impact on the state government or the KSEB.

"Organisations were formed by academics, scientists, environmentalists and public spirited men throughout the country to serve as focal points of public action against the project. An attempt was also made by the Friends of Trees and the Society for protection of Silent valley (Regd.) at the High Court of Kerala to halt the execution of the project. A stay order was obtained from the court and this gave a temporary respite."*

The second group was formed of people outside the state of Kerala who were concerned about the issue. These people also agitated, and publicised and were vocal, again very often through organisations like the Bombay Natural History Society (BNHS), the World Wildlife Fund-India and the Save Silent

(From *The Silent Valley Crusade—A Case Study*, typed manuscript of paper presented at the Indian Institute of Science, Bombay, on November 19, 1980 by Prof. M. Sivasankaran and Prof. M. K. Prasad, pp. 4-5).

Valley Committee. In fact many in this group got activated mainly as a result of the letter sent by BNHS, in July, 1978, to all its members requesting them to send letters to the prime minister asking him to save Silent Valley. A large number of people responded.

The third group was the group of scientists and experts, both within and outside Kerala, who were agitated over the project and offered their expertise and views to various organisations, signed appeals and served on governmental and non-governmental committees. They also independently studied the problem and prepared reports and wrote articles.

But all this was not without opposition. There were many people who supported the Silent Valley project and considered the conservationists anti-development and even 'inspired'. Perhaps an extract from Dr. Salim Ali's address to the press on January 22, 1980, at Bombay, would give an idea of the controversy:

For the first time in India there is popular awareness and discussions of the ecological costs which the common man has to bear for a project whose contribution to power generation in the country is insignificant. When the Kerala Electricity Board engineers have themselves estimated in their 1976 publication that about 70 per cent of Kerala's hydel power is yet unexploited, and when they have themselves listed 20 other hydel projects which are due for implementation, one would have expected the Electricity Board to proceed with other alternatives while the Project is re-examined. It is highly detrimental to the long term public interest to bypass the major ecological issues posed by Silent Valley in reliance on bureaucratic sanctions or legalistic justifications. Nor is it proper to term the widespread opposition the project as being 'inspired'. In what way are thousands of people from Kerala, scientific institutions, the Central Government, eminent citizens like Mr. K.P.S. Menon, Dr. M.S. Swaminathan, Mrs. Mrinalini Sarabhai, for that matter, you and I, inspired?

In fact, the opposition also organised themselves into groups, one called the Environmental Planning and Conservation

Society, and another called Save the Project Society. Points and counter points were made, pamphlets and books were published by each side and counter allegations made. In the words of Prof. Sivasankaran and Prof. Prasad:

The conservationists were branded as anti-development people and even as agents of CIA. A bizzare organisation called the Environmental Planning and Conservation Society sprang up from nowhere and started publishing books and pamphlets on Silent Valley. These publications vociferously demand the execution of the project and denigrate and deride the environmentalists.

The opposition made:

—considerable references to the interest of smugglers and poachers in saving Silent Valley and conspiracy of the developed world in keeping underdeveloped regions in a continued state of underdevelopment, unfortunately some Indian scientists, in all innocence, were assisting these imperialistic designs.

The one remarkable result of this debate was that every possible aspect of the issue was examined in the greatest possible detail and, what is even more surprising, all these scientific debates were made public and followed by thousands of people. A film, audio-visuals and a pamphlet were prepared. Like a true debate, efforts were made to answer the opposition point by point.

The pamphlet, in itself, was an impressive document, impeccably produced and very clear in its language. It was published in English and in Malayalam, and distributed widely. I cannot resist quoting from it:

“What does the Hydel Project offer?

“At an estimated cost of over Rs. 70 crores the project offers the following:

1. 120 MW of installed capacity, or 60 MW of ‘firm

- power' for the Malabar Region.
2. Irrigation for 10,000 hectares in the Mallapuram and Palghat districts.
 3. Employment to about 3,000 people, during the 6 years construction phase.
 4. Development of the 'backward' Malabar Region.

"Are there power, irrigation and employment alternatives to the Silent Valley Project?

"The price of this project for Malabar, Kerala, and the country, far exceeds the limited benefits that the project offers. This price becomes intolerable when the project is not really essential and when the sum of Rs. 70 crores to be spent on this single project by the KSEB could secure the same or greater benefits for the people of Malabar if used as follows:

"Power: In 1976, the Kerala State Electricity Board estimated that 70 per cent Kerala's hydel power was untapped. Over 20 projects were scheduled for implementation, of which Silent Valley is only one. None of these are in an area comparable to Silent Valley in terms of ecological importance and the KSEB could therefore proceed with over a dozen other projects which they have already scheduled for implementation.

"Extension of transmission lines from Idduki to the Palghat/Mallapuram area could bring additional power to Malabar faster than the Silent Valley project. A high tension transmission line from Idduki to Mysore is already planned, and only feeder lines are needed. Estimated cost—Rs. 15 crores.

"Irrigation: Lift irrigation through 10,000 wells and pump sets would irrigate 10,000 hectares more efficiently and economically than surface irrigation in this undulating terrain. Estimated cost—Rs. 10 crores.

Employment and development: Starting of new industries, and particularly of the Malayar Cement Factory which has been long delayed for want of funds, would provide more employment, both directly and through ancillary development, more quickly and for a longer period than the 5 or 6 years of project construction activities would. Proposed expendi-

ture—Rs. 15 crores.

“Construction of rural roads in Malabar would help to develop this area. Proposed expenditure—Rs. 5 crores.

“Development of agro forestry in denuded areas but not through felling of rain forest—will yield employment, revenue and protection to agriculture in the area. Proposed expenditure—Rs. 5 crores.

“The power, irrigation, employment and development benefits of the hydel project can thus be met at a lower cost, and secure more lasting benefits to the people of Malabar than the Silent Valley Project could.

“The total cost of these alternatives would be Rs. 50 crores, as against Rs. 70 crores for the Silent Valley Project. An amount of Rs. 20 crores would thus still be available. It is for the people of Kerala to decide whether to invest this in projects which export power to other states, thereby subsidising their development, or to invest this in the development of Kerala itself.”

The debate still goes on, and the issue hangs fire, but whatever the outcome, the campaign again offers unique insights into the methodology of people's participation. It achieves all that the Chipko Andolan achieved, and more—for here highly technical questions are perhaps for the first time shared with the general public, and there is a movement of information and views between the scientists, the people and the government. It is also perhaps the first example of people's participation in environmental conservation where active concern for the issue has been felt not only in the specific region but in the country and, in some senses, in the world. Perhaps an extract from the Resolution of the 14th General Assembly, at Ashkhabad USSR, of the IUCN will both establish the point about international concern as also raise some interesting questions about who could be the foreign interests, if there are any, who want to retard India's growth by helping block the Silent Valley Project.

(The IUCN) “—specifically urges the Government of India to conserve more effectively the forest areas of the Western Ghats, including the undisturbed forests of the Silent

Valley of the State of Kerala—"

THINGTAM IN MIZORAM

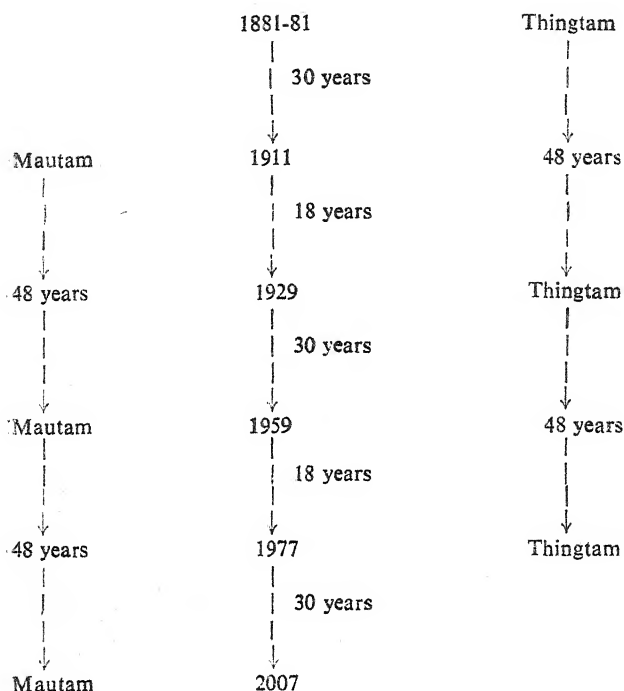
Bamboos, as might not be generally known, flower cyclically. The plant flowers and drops its seeds, and then dies out. New Plants come up from the seeds and survive for a specific period and then the cycle is repeated: a true phoenix. The earliest account of this phenomenon that I have been able to discover is penned by G. Jasper Nichols, I.C.S., in 1893 in the BNHS Journal, Vol. VIII.

In Mizoram, a union territory in north-east India, the cyclic flowering of bamboos has a special significance. for whenever each of the two common varieties of bamboos flowers there is an accompanying increase in the rat population which, in its turn, leads to a famine.

Though there are about 16 species of bamboos in Mizoram, the most abundant are the *Melocanna Bambusoides* (called Mautak in the Mizo language) and the *Bambusa tulda* (called *Rawthing* in Mizo). A large part of the hills in Mizoram are covered by these two varieties of bamboos, and the fact that there are relatively few trees and other form of vegetation makes these species very crucial to the overall ecology.

Briefly, when either of these bamboos flower, the flowering is followed by various ecological manifestations including an immense increase in the rodent population. These rodents then, moving in hordes, attack the standing crops, especially rice, in the *jhums* (areas under shifting cultivation) and sometimes in a couple of hours strip acres of standing crop. This has resulted, in the past, in Facute Amines. The cycle of the flowering is indicated on page 140.

It is perhaps not widely known that the roots of the Mizoram insurgency, and the outlawed Mizoram National Front (MNF) are to be found in the *Mautam* of 1959. Laldenga, the present leader of the MNF, formed in 1959-60 the Mizoram National Famine Front (MNFF) with the objective of fighting the famine. It was only later that the extra 'F' was dropped and the organisation became the MNF with drastically different objectives. Further, whatever little sympathy the MNF got from the people has often been attributed to the neglect that the Mizo's perceived, on the part of the



NOTE: 'Tam' in Mizo means famine, and 'thingtam' and 'Mautam' mean the famines caused by the *Rawthing* and *Mautak* bamboos respectively.

central and state governments (Mizoram was then the Lushai Hills District of Assam), while suffering from the famine in 1959.

I had the opportunity, before and during the 1977 famine, of working with a participational effort at controlling the ecological effects of the flowering bamboo, and of minimising its repercussions.*

Briefly, the effort had the following objectives:

1. To educate the people about the phenomenon and to

*This was in my capacity as NSS coordinator for the states of Meghalaya and Nagaland, and for the union territory of Mizoram.

train them in methods of rodent control.

2. To work out a system by which teams of volunteers could be sent to various parts of Mizoram for crisis management when the rodent menace became serious.
3. To train members of such teams.
4. To collect specimens and data which could be subsequently analysed in various laboratories and institutions, with the objective of determining the cause of this peculiar phenomenon: especially as no body really knew why the rats multiplied and what could be done about it.
5. To provide immediate relief wherever extensive damage to the crops had been done and food was becoming scarce.
6. To assess the damage to crops so that adequate compensation could be paid by the government.

Keeping these objectives in mind, a proposal was sent through the state government to the Planning Commission and subsequently approved.

Meanwhile, the NSS kicked off by organising a series of training courses, in 1976, designed to train student volunteers and college teachers for the work ahead of them. Surprisingly, many of the officers of the state agriculture department also showed keenness to attend these courses, and were accommodated. These trained students and teachers were then sent out to villages to impart basic training to the villagers for fumigation, baiting and digging pits around the *Jhum* areas.

Preliminary discussions also identified the three primary agencies which would be receiving and analysing the data collected by the volunteers: these being the ICAR, The Department of Zoology, University of Delhi, and the School of Life Sciences, North-Eastern Hill University, Shillong.

By the time the bamboo started flowering and the rats started increasing, there were over 2000 students and teachers ready to go into the field. Small groups were formed, mainly of students, with a few teachers and officials of the agriculture department.

The coordinator was in wireless contact, courtesy the Assam Rifles, with Aizawl, Champhai and Lungleh and could,

whenever necessary, direct groups to the villages that were about to be attacked.

The volunteers, in groups of five or six, went from village to village warning the villagers of the impending influx of rats. (This was possible because the rats mainly moved in groups of thousands, and once their route was identified, along with their speed, it was often possible to predict where they would strike next) and helping them to prepare their fields. They also collected data and alerted the government on where relief was urgently needed. I quote from the report sent by one of the groups:

The campaigners were divided into four groups with ten NSS students in each group and accompanied by villagers and two agricultural experts.

Everyday, in the evening of the day of arrival in a particular village, group centre, etc., a meeting was held with the villagers where the Village Council President, members and the YMA President and Secretary along with the administrative officer and the church leaders were present. A comprehensive programme was chalked out for the next day and reports were collected with regard to the damage caused by rats.

The next day, several groups were made from among the villagers to cover different areas. The NSS students placed baits in the *Jhumming* areas and demonstrated the various processes of rat killing in the field. Women took a leading part in the work in the villages.

(Extract from Lungleh College Report).

In the final phase, the students were involved in assessing the damage caused in different areas, as also collecting additional information asked for by the institutions conducting research.

CONCLUSIONS

The three different examples of people's participation that I have mentioned might give us some of the data that are needed to think about the fundamental questions that I had

raised at the beginning of the paper. Details of various other participational efforts are also available. Perhaps the time has come to seriously consider what people's participation means, how can it be evoked, what are its implications and how far is it desirable: all in the context of environmental conservation. □

PEOPLE'S PARTICIPATION IN CONSERVATION:
THE BOMBAY PRESIDENCY*

G. MONTEATH

To take the villager first—his share of the damage done in the past in this part of India, where, as far as I have been able to find out, he has had no inducement of profit worth considering, is negligible, and his present activities hardly make enough impression by themselves to counterbalance the natural increase of the species he is generally concerned with.

TRADE IN HIDES AND HORNS

If there was money in it for the villagers, illicit hunting in forest districts might be a more serious matter, but I never found much evidence of that kind of inducement. No doubt there has always been some illegal trade in 'forest produce'—horns, hides or meat for the purposes of this article—and no doubt it continues. Sambur leather I know is exported to England, but I do not think much, if any, of it comes from our part of India. I could never in fact discover that there was enough of this kind of trade in the districts I knew to matter very much—unlike some provinces, to judge by what I have heard and read—or that most of what there was done through the agency, or to the pecuniary advantage of forest villagers.

*Extracts from Reports published in the *Journal of the BNHS*, Vol. XXXVII, 1933.

THE PRESERVATION OF WILD LIFE IN INDIA: ASSAM*

A.J.W. MILROY

The question of affording adequate protection to game in Assam is a difficult one that we cannot expect will receive much local attention just now with so many important political changes staged for the immediate future, but in view of the imminence of these inevitable changes in administration it might be undesirable to postpone any longer the consideration of what system of preserving the fauna, whether the present one or something on different lines, will be most likely to survive the introduction of provincial autonomy.

Up to thirty years ago these were still very extensive unoccupied tracts in the province, the first to disturb them being Gurkhali buffalo-keepers who began then to invade Assam with their herds, to be followed by ever-increasing hordes of immigrants, after the Brahmaputra Valley had become linked to Bengal by the railway.

Rules regarding close seasons had been framed at an early date for the Reserve Forests in conformity with practice in other parts of India, but game remained entirely unprotected in the waste lands known as Unclassed State Forests, until about 1910 when close seasons were introduced following a letter to *The Times* by Sir Harry Johnston on the indifference shown by provincial governments in India to the fate of their wild animals; but as no fees have ever been charged for shooting in the Unclassed Forests, there have been no funds for the maintenance of a special patrolling or protective staff, and the protection afforded by the rules alone has consequently been very meagre.

The most interesting bird that Assam can boast of is the Pink-headed Duck (*Rhodonessa caryophyllacea* Latham), which is possibly extinct elsewhere). There were a good few at one time in some lagoons known to the writer and a few friends, but their number was unfortunately thinned out by

*Extracts from Reports published in the *Journal of the BNHS*, Vol. XXXVII, 1933.

a baboo doctor posted in the locality in connection with Kala-azar duty, who was the possessor of a gun and, as he liked eating these ducks, of a most indiscriminating palate. The jungle which protects the lagoons is gradually being cleared away and with it the last of the duck is likely to disappear.

THE UNITED PROVINCES*

F.W. CHAMPION

One among the numerous striking results of the Great War has been an awakening all over the world to the fact that wild animals are tending to become less and less in numbers in many countries, and often species that were common a few decades ago are being, or actually have been, entirely exterminated. Most of us who went through the War saw far too much of killing ever to want to see any more, and the natural reaction has been that a new spirit of sympathy with wild creatures has become firmly established in many countries. Wild life protection societies are springing up here and there, particularly in America and England, and the Society for the Protection of the Fauna of the Empire is doing great work in trying to preserve the wonderful fauna of the British Empire from further wanton destruction. An enthusiastic branch of this Society has been started in India and very good work is being done, but unfortunately it is not receiving so much support from Indians as could be desired. Indians, many of whom are prohibited by their religion from taking life, should be the very first to support such a Society and a number are already whole-heartedly doing so, but real mass support has yet to be received. This I believe to be very largely due to lack of knowledge of the aims and objects of such a Society, and insufficient propaganda, and I am confident that much greater support will be received in future as a result of the great efforts now being made by the Bombay Natural History Society and the various local

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branches of the Society for the Preservation of the Fauna of the Empire, which all who have the slightest interest in wild animals should join without a day's further delay. After all, once a species of wild animal has been exterminated no money, no society, no human agency can bring that species back to the world, and delay in helping those who are doing their best to save species already threatened with extermination may mean that help, tardily given, is given too late.

SOME SUGGESTIONS

The writer would make the following suggestions to help the present state of affairs:

Public opinion: This is by far the most important of all methods of wild life conservation, and, without it, all efforts to preserve wild creatures will prove abortive. Good work is already being done by propaganda and by lectures, but much more remains to be done. Good illustrated books help greatly and the formation of sanctuaries and national parks, where the general public can see wild animals in their natural state, would all help. Major Corbett as local Secretary of the United Provinces branch of the Preservation of the Fauna of the Empire Society is doing a lot to assist in this work.

THE PRESERVATION OF WILD LIFE IN INDIA: THE MADRAS PRESIDENCY*

R.D. RICHMOND

PROVISIONS FOR THE PROTECTION OF WILDLIFE

In a consideration of the preservation of the fauna of the Madras Presidency it is to be remembered that there, as in the rest of British India, the state owns large areas which have been constituted Reserved Forests and which, if properly administered in this regard, form permanent abodes

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for game and other animals. All possible types of country are represented and all the large animals, with the exception of the antelopes, are thus provided with potential sanctuaries. The habitat of the antelope is for most part the plains and open fields, but there are certain areas of reserved forest in which they are able to, and do, take refuge.

While the closest attention is paid to certain classes who will not ordinarily infringe the rules, it is to be feared that the Indian licence-holder, few of whom shoot for sports' sake, who pays little attention to the conditions of his licence, and who will entrust his gun to other parties, is poorly controlled. And of recent years the policy has been to grant licences to possess arms to a greater and greater extent, and any one with a gun who lives within reach of areas containing game, is a potential poacher. Also a class of licence, that for crop protection, is responsible for considerable damage; damage which might be mitigated would those responsible consent to the peasant being put to the inconvenience of depositing his arm with the police at times when there are no crops to protect. A further handicap to game conservation is the extremely rapid Indianisation of the Forest Service: officers of the new class take at present little or no interest in natural history or in the preservation of wildlife and, as a rule, other activities prevent them from paying sufficient attention to a part of their duties with which they are in little personal sympathy. The difficulty is that there is no public opinion on the subject of game preservation in the country and until this has been created, little will be accomplished. The jungleman is principally poacher, for food or to obtain meat for sale.

RECOMMENDATIONS

There is no need to apprehend that the fauna of Madras is decreasing to a dangerous extent at present, though it would be idle to pretend that there are not forces at work which should be guarded against. Apathy on the part of a new class of officer who is not interested in sport or natural history, and the increased facility with which arms may be legally possessed may both be corrected. Public opinion may in course of time be developed, though this will necessarily be a

slow process and it will be fatal if the impression is formed that the interest of the cultivator will not be protected. There is ample room for the wild animals in the considerable areas of forest land which is the property of the state and which need never be alienated, all that is required is the determination to make protection effective. 'Preserves', in this Presidency at all events, appear to be uncalled for—the whole of the forest area is a 'preserve'—and the regulations permit of certain parts being closed to shooting either permanently or temporarily. 'National Parks', if by these are meant areas which are specially protected and in which no shooting by the public is allowed, but which are maintained so that the public may see and study the habits of wild animals, are on a different footing. These should be of great general interest and educational value and tend to promote that public opinion which is so desirable. A difficulty in connection with these 'National Parks', however is their location; they should be near areas of considerable population, and be served by the roads; also the forest should be of a type which allows of the animals being easily seen. It is perhaps sometimes overlooked that conditions in different countries vary and that what may be suitable in Africa, for example, is inappropriate in Madras. □

REMARKS OF THE PRINCIPAL DISCUSSANT

MAHESH RANGARAJAN

I am very much after what Shekhar has said. He has pointed out perhaps one of the most important things which seems to be lacking in development and in environment in India, which is some sort of a consciousness among so-called decision makers to be aware of the problems of the people. It must be realised that the environment is not the problem of the government, it is the problem of the people and as Dr. Aggrawal was saying today, the concept of environment was not conceptualised by some decision-maker or some bureaucrat or some administrator or some politician. It was and is the concept of the people.

In this context, much has been said in the past two days about awareness. It seems to me to be the thrust of the discussion. "The majority of the people in our country are illiterate, uneducated, unaware of environmental problems and what we need is an army of educators who will go out and educate them about the environment, who will tell them what the problems of the environment are, so that they will change their way of living. They will accept family planning or they will stop cutting trees or whatever and we will have a total change because of consciousness?"

This picture is attractive. It is misleading because it ignores the fact that awareness is not like an injection to be 'put into the people' but a product of dialogue, and of the experiences of the people themselves. Consciousness is not of any use unless it can be translated into action and over the past thirty years, in different parts of India, we have seen the consciousness of the grassroots, not only in urban areas where seminars and symposia are held, but at the grassroots, among the actual people of this country.

There is no need to go and tell a person who lives in a slum or a resettlement colony in Delhi that there is a problem of drinking water in India. He knows it. He may have had a child who has died because of diarrhoea or because there is inadequate water available. He is not to blame for it. It is the development process, the type of development we have chosen which has not improved his conditions. This very contention which seems to underline all of our thinking, quite a few of us at least, that the people must be educated and the government must do the job is incorrect: there is something fundamentally wrong with it.

In this context, one must perhaps pick up this question of development. It is obvious to anyone who looks at it that development is required for countries like ours. We have to raise the living standards of the people, whether one takes it in terms of water, food, shelter or clothing, the absolutely low standards of living have to be improved. But if one looks over the past few years and the type of development which we have been having, one finds that there has been a neglect not only of environmental costs of development, but of the social costs of development. In fact, in instance after instance, far from benefiting the people, development is not only harming the environment but further worsening the condition of the poor people. Just a few cases could illustrate this point.

In places such as Goa or Kerala, perhaps all over the country, along the sea coast, it is government policy to encourage trawling. Trawling brings in much bigger fish catches but trawling also ruins marine ecology. Trawlers, because of their suction, suck up fish eggs. They ruin the marine ecosystem in the coastal areas. Besides this, these trawlers, in Goa and various other places, are to a great extent operated either by members of non-fishing communities or by people who can afford to have a trawler. And the small fisherfolk who really depend on fishing have their livelihood endangered. There is, in fact, a massive battle going on in places such as Kerala over this whole question of where trawlers should operate, where small fisherfolk should operate and in instance after instance, irrespective of the government in power, the decision of the government is favouring the trawlers not the fishermen.

Every body, everywhere, today says that contractors are responsible for denudation of the forests. The government accepts it. In fact, the Dhebar Commission had pointed out in what ways contractors were destroying the forests and way back in 1976 the government said—we are going to abolish contractors and we are going to have forest development corporations. Till today, it has been 6-7 years, there are four states which have forest development corporations and in 1981 the government was considering another ten-year perspective plan to eliminate contractors. In other words, these plans remain on paper. The contractor lobby continues to be in operation in almost all the states in India and, as we have said earlier, even where it is not in operation the overriding principle of forestry in India is to manage forests for profits. It is not to manage forests for welfare.

We can argue about this if we like, but just take a glance at the new forest bill which has come up. One of the most interesting clauses in it is that it ensures public participation in urban areas. Tomorrow if there is an urban tree-area and we in Kalpavriksh or say any other environmental group want to take part in protecting it, we can take part. There will be an urban tree authority. There will be provision for voluntary agencies to take part. Mind you, that same bill makes absolutely no provision for rural areas. Maybe the government assumes that the people in rural areas lack brains or perhaps it is just that the interests of such people is not kept in mind. This is perhaps the most 'harmless' of all the clauses of this forest bill which is presently being circulated and which has brought about so much of controversy. Therefore, what one would say is that the focus of our discussion must be that there is a contradiction, at times, between the use of natural resources for ecological reasons, between the need for material resources for the livelihood of people and the need of these natural resources for commercial interests. But over these past so many years our socio-economic structure is such, and our political system is such, that it ignores the legitimate needs of the people and emphasises the commercial interests. It is this that in every sector perhaps has been responsible for environmental problems. If some one goes and cuts a tree, it is important to ask why they

are cutting the tree and if the poor people are going to cut the trees, which incidentally they don't for they normally gather twigs and branches, for burning or for cooking, they are going to continue to do this unless they are provided with an alternative.

Today there is a lot of talk of solar power. Scientists tell us that they are going to bring out solar power and solar power is going to solve all the energy problems of India. Biogas plus solar power—that is the end of the energy crisis for the poor in India. In fact, if some one has even a cursory glance almost all the solar power projects which have been there are essentially concerned with things like providing for heating bath water for five-star hotels. Incidentally, for the Asian Games we are spending 21 crores for the solar water heaters for the five star hotels. And in terms of cooking, very little has been done. The solar cookers which have been developed are just too costly and anyone who expects the women or whoever cooks food to stand out in the sun in the day time and cook food, really doesn't know what this country is, doesn't know the broader reality of this country.

As for biogas, it has already been pointed out that private biogas plants are affordable only by a certain fraction of the people. They are just too costly. As far as community plants are concerned, unless there is a fundamental change in the socio-economic structure, it is not possible for the community biogas plants to emerge as an energy alternative. Why, then, is solar energy advocated? Maybe the scientists want to find jobs, or perhaps in the name of environment other vested interests want to take advantage of the problems which have arisen. Or, perhaps, it is the rural rich who want the government subsidies for the biogas plants. If one just looks at these problems, these questions cannot but arise.

Environment is not a problem of nature, it is a human problem. It's a problem because certain people do benefit tangibly and definitely from environmental destruction and certain other people do not benefit and whenever there are *andolans* or whenever there are movements—several movements have been there: there has been the 'Chipko' *andolans* in Uttarakhand; in Maharashtra there has been the Kashtkari

Sangathan, the Shramik Sangathan, the Bhoomi Sena, in Jharkhand there has been the Jharkhand Mukti Morcha, in Delhi there has been Kalpavriksh, there have been others. Hoshangabad: the Mitti Bachao Abhiyan—Kerala, the Kerala Shashtra Sahitya Parishad—it is such organisations that actually reflect the concern of the people. Though on a countrywide scale such a trend is not large, it is undoubtedly significant.

In instance after instance the aspirations of the people to improve their environment are thwarted. Why are they thwarted? Why is it that a new forest bill is today being introduced, for instance, which prevents the tribals from going into a forest and picking up a flower but does not stop the forest department from, say, leasing out a vast tract of land to, say, Gwalior Rayons as in Kerala. I think it is these fundamental questions which must be faced and unless we face them we will not be able to resolve this question of public participation. Public participation has to take place with a purpose and the purpose has to be the people's welfare. Why is that purpose not being served? ☐

ABSTRACT OF DISCUSSION

(*Chairman's remarks*): "I think before I open up for discussion what Shekhar has briefly said in his introduction, I would like to refer back to the discussion abstract also and raise some of the points we need to discuss more thoroughly. I think the first issue probably is the question of why should people participate and what level of participation are we talking about. I mean, are we talking about the people's participation only at the local level or also at the national level or the macro-level and if we are talking of participation at both these levels—the local level and national and macro-levels, are these any different in form, in method, in mechanics.

One important issue that has been raised is the question of the conflict that arises if there is a purely local participation. Probably there might be a conflict if this local participation is isolated from some kind of a macro-level participation. There is a conflict of interests at the local level with what is happening at the macro-level, or what is designed to happen at the macro-level. I think that this is the issue that Shekhar has raised, where local participation can be both negative and positive, and Mr. Rangarajan has also talked about local participation as representing the aspirations of people. And these aspirations of people, are they in conjunction with the national aspirations or not. I think this is an important segment of the discussion. This is the issue on which we need to spend some time: local participations for what? and in what way, and what is the purpose of this local participation.

I think the second issue that I will again like to draw your attention to is this business of environment related to the development process. Can you isolate the two? You can follow particular development processes: some sort of industrialisation or some type of commercialisation or dependence on a certain group of people as engines of growth and engines of development. You can also talk of environmental protec-

tion. The conflicts between the two can be better resolved if they are more closely linked and environmental protection is built into the development processes, rather than looked at segmentally.

The third issue of people's participation that, I think, is quite important, which again one should look at, is : Why is it necessary for people's participation when there are democratic institutions existing. This is another question that Shekhar has raised. Do the existing democratic institutions provide for all these methods or mechanisms for people to participate or is it that you want certain extra machinery to develop as far as people's participation is concerned.

I will not go into the other issues that have been raised, but I really thought that these three or four issues regarding people's participation should really be discussed."

A point was made that patterns of rich/poor domination repeat themselves as man/woman dominations. The Chipko movement is a good example of this.

The movement was not only spearheaded by the women but often the confrontation is not between outsiders and the local people but between the local men, who couldn't care less if the women have to walk another 10 kms. to get their firewood, and the women who insist on protecting their livelihood.

Environmental degradation, as such, is as much the result of internal conflicts in the society as it is of external intervention.

Similar experiences occurred with regard to community bio-gas plants, for the cooking energy so provided was used by the women, but all decisions were made by men, who soon considered it too much of nuisance to collect dung. But women were never consulted or involved, for all 'community' decisions were taken by the men only.

People's organisations are needed, for if decisions are left to the politicians and bureaucrats, these decisions will reflect their vested interests.

Unfortunately, though consultation has been clearly shown as a role of the voluntary agencies, the government does not seem to react to suggestions. They only react to agitation. The Chipko movement, the Silent Valley move-

ment, or other such, clearly bring out this fact.

The government itself is some time the greatest destroyer of the environment. Take, for example, the case of the ridge in Delhi, 40 per cent of which has been destroyed by the government itself. And yet it turns a deaf ear to the plea that firewood plantations be provided around the outlying colonies of Delhi, as the people there still depend on firewood for their fuel.

People's movements can also themselves be misguided or corrupt, and very often under the guise of people's movements various vested interests block developmental projects. Extreme caution, therefore, has to be exercised.

As an example, there were farmers in Kerala who were opposing the Silent Valley project, but not for its ecological implications but because they felt that if the dam work started then prices of labour would go up and they would have to pay a higher, and fairer, wage to their labourers.

Even if there is a representative democratic government, people's movements are essential for it is at least partly through such movements that the elected representatives get to know of what is happening in their constituency. □

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